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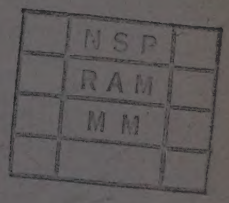

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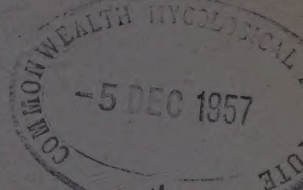

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COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

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DISEASES CAUSED BY BACTERIA AND FUNGI

OLSEN, E. M. (1956). Om inkuberingsvaedsker ved diagnosticeringen af mastitisfremkaldende bakterier. **[Use of selective inhibitors in the cultural diagnosis of mastitis organisms.]**—*Nord. VetMed.* **8,** 539-561. [In Danish. English and German summaries.] **3477**

The selective medium described by Livoni [*V.B.* **26,** 2153], containing sodium azide, crystal violet and bromthymol blue, was considered to have no advantage over media containing sodium azide alone, at a conc. of 1:40,000.—R.M.

KARLSHØJ, K. & PEDERSEN, P. S. (1957). Eksperimentel yverinfektion med Streptococcus agalactiae. **[Experimental infection of the udder with *Streptococcus agalactiae*.]** —*Nord. VetMed.* **9,** 409-420. [In Danish. English and German summaries. English summary modified.] **3478**

The authors used a method elaborated by L. Szabo—culture in the milk of the cow which is to be infected, the milk having been previously heated (twice with an interval of 24 hours) to 70°C. for 30 min. The culture is diluted to the required content of streptococci in a sample of the same milk. The inoculum is introduced into the sinus by syringe and blunt cannula so as to pass the barrier of the teat canal. The results reported, together with those obtained by Szabo, prove that it is possible to produce a persistent udder infection with small numbers of streptococci, when these are adapted to milk. The lag phase, ability to multiply, and virulence of the Group B strain used were not noticeably affected by storage in milk at 4°C. for 17 hours.

WILSON, A. T. (1957). **The leukotoxic action of streptococci.**—*J. exp. Med.* **105,** 463-484. [Author's summary modified.] **3479**

Following phagocytosis of certain streptococci human neutrophiles undergo a rapid disintegration: the leucotoxic reaction. Monocytes and eosinophiles are similarly injured, as are polymorphonuclear cells of rabbit and g. pig blood. The leucotoxic injury is not produced by culture filtrates of leucotoxic cocci nor does it follow phagocytosis of heat-killed cocci. It does not appear to be due to action of any known streptococcal product. The distribution of leucotoxicity among streptococci is not random, for it was found in all strains tested of certain types of Group A, and was absent from almost all strains of other types. Still other types had both leucotoxic and non-leucotoxic representatives. The injury was also produced by some Group C and G strains. Often the streptococci that cause leucocyte death remain alive and proliferate in the cellular debris, but sometimes they are injured by the phagocyte before it disintegrates, and are unable to proliferate on the slides. The capacity of a strain of streptococcus to injure leucocytes does not necessarily confer virulence on it. This is thought to be because a chain of streptococci, having survived its sojourn in a leucocyte it has killed, is still susceptible to phagocytosis by a fresh leucocyte, and serial phagocytoses may continue until the chain has been exposed sufficiently to the unfavourable intracellular environment to be, itself, killed. Whether leucotoxicity plays a role in natural streptococcal disease is not known. The high incidence of leucotoxicity in Type 12 strains suggested that it might be involved in acute haemorrhagic nephritis, but if so there must be other factors since leucotoxic strains are present in types and groups not known to be associated with nephritis.

MORA, A. & NUNES PETISCA, J. L. (1957). Tubercolosi equina. Aspetti anatomo-patologici. Criteri ispettivi. **[Pathology of TB. in horses.]** — *Zooprofilassi* **12,** 227-242. [French and Spanish summaries.] **3480**

The incidence of TB. in horses is briefly discussed; it appears to be higher than is generally believed. The horse is equally susceptible to the human, bovine and avian types of *M. tuberculosis,* there is no breed susceptibility

and heredity does not play an important part; congenital TB. is exceptional and the susceptible age is 4–8 years. The lesions are not limited to the classical tubercle with central caseation and calcification but quite often resemble sarcomata with a tumour-like consistency. Infection occurs through the alimentary tract, the primary lesions appearing in the pharynx or small intestine. The tonsils and regional lymph nodes are affected. The primary lesions may become calcified or they may develop and lead to generalization with miliary lesions in the lungs, when agglomeration with nodule formation may occur with lesions in the associated lymph nodes, rarely in the spleen, liver, kidneys or meninges. Lesions may also occur in the nasal mucosa. The microscopic appearance of the lesions is described and the evaluation of infected carcasses at meat inspection is discussed.

—T.E.G.R.

ROBSON, J. M. & SULLIVAN, F. M. (1957). **The effect of cortisone on the multiplication of *M. tuberculosis* in normal and immune mice.** —*Brit. J. Pharmacol.* **12,** 240-244. [Authors' summary slightly modified.] **3481**

The multiplication of bovine type *M. tuberculosis,* inoculated into the cornea of mice, was studied by staining the whole cornea at various stages after inoculation. Four groups of animals were studied: untreated animals, animals treated with cortisone, animals previously immunized with the same bovine strain, and immunized animals treated with cortisone. In the untreated immunized group little or no multiplication occurred. In the other 3 groups multiplication did occur and was about the same for the first week after inoculation. After this stage, cortisone-treated animals, whether previously immunized or not, showed increased multiplication and massive cord formation, as compared with untreated animals in which little further multiplication was seen. The cortisone treatment had thus completely suppressed immunity. The significance of these results is discussed.

SPIESS, H. (1956). Tierexperimentelle Untersuchungen mit J^{131}- markiertem Tuberkulin. **[Fate of I^{131}-labelled tuberculin after intradermal injection in g. pigs.]**—*Klin. Wschr.* **34,** 1090-1094. **3482**

Intradermally injected tuberculin diffused from the site of injection faster, at first, in tuberculin-negative g. pigs than in reactors. Later the rate of diffusion slowed down and tuberculin was still present at the site of injection after 4 weeks. There was no special accumulation of the injected tuberculin in tuberculous tissue.—R.M.

BAUMANN, R. & RITTERSHAUS, E. (1957). Tuberkulinierungsversuche an mit Mycobacterium suis infizierten Meerschweinchen. **[Tuberculin reactions in g. pigs infected with *"Mycobacterium suis"*.]** — *Dtsch. tierärztl. Wschr.* **64,** 123-124. **3483**

Eight g. pigs infected s/c with *"Mycobacterium suis"* [see *V.B.* **26,** 3685 & **27,** 1339] reacted not only to the strain-specific tuberculin, but almost as strongly to bovine, human and avian tuberculins.—M.G.G.

ALBORNOZ, J. E. (1957). Quelques observations sur la paratuberculose bovine en relation avec la transmission expérimentale, et les lésions nerveuses. **[Study of experimental transmission of Johne's disease and of the lesions in the nervous system.]**—*Bull. Off. int. Epiz.* **48,** 477-485. **3484**

The author studied Johne's disease in Colombia. In 8 cases the sciatic nerve and brachial plexus were hypertrophied, and oedema, congestion and haemorrhages were present in the nerve tissue; such a chronic sclerotic neuritis was similar to that observed in leprosy. He suggested that these lesions could be the cause of the muscular atrophy occurring in Johne's disease. It is not stated in what proportion of cases these lesions were found.—R.M.

JACOB, K. (1956). Zur Pathogenese der Pyogenesmastitis des Rindes. **[Pathogenesis of *Corynebact. pyogenes* mastitis.]** — *Mh. VetMed.* **11,** 703-704. **3485**

J. examined in detail 12 affected udders, and concluded that infection entered through the skin.—R.M.

BARKSDALE, W. L., LI, K., CUMMINS, C. S. & HARRIS, H. (1957). **The mutation of *Corynebacterium pyogenes* to *Corynebacterium haemolyticum*.**—*J. gen. Microbiol.* **16,** 749-758. [Authors' summary slightly modified.] **3486**

C. pyogenes gave rise to mutants indistinguishable from *C. haemolyticum. C. pyogenes* ferments lactose and xylose (Xyl+), elaborates a soluble haemolysin and/or a proteolytic enzyme (H^+), and its cell walls contain glucose units in addition to certain other components. On horse blood agar *C. pyogenes* forms small colonies (*s*) surrounded by large zones of haemolysis. *C. haemolyticum* and the mutant derived from *C. pyogenes* ferment lactose but not xylose,

produce no soluble haemolysin, and glucose cannot be detected in hydrolysates of their cell walls. The change in the basal structure of the cell wall is accompanied by a lack of immunochemical cross-reaction between the wild type and the mutant or *C. haemolyticum*. On horse blood agar both *C. haemolyticum* and the mutant produce relatively large colonies (*L*) surrounded by narrow bands of haemolysis. The possibility that a single mutation involving cell-wall structure may account for the apparent change from Xyl^+H^+ to Xyl^-H^- is discussed. It is suggested that neither *C. pyogenes* nor *C. haemolyticum* is a corynebacterium, and that taxonomically both organisms belong to the genus *Streptococcus*.

Sokol, A., Rosocha, J. & Tirčó, S. (1956). Študiá o vhodnosti komplexného koncentrovaného antigénu k rýchlovýrobe homológneho protičervienkového séra. **[Suitability of concentrated antigen for the production of homologous swine erysipelas serum.]**—*Folia vet., Košice* **1**, 97-110. [In Slovak. German and Russian summaries.] **3487**

The authors described a concentrated swine erysipelas antigen, prepared from *E. rhusiopathiae* strains, grown on blood agar and subsequently transferred separately to horse serum-peptone broth and serum-lysate media, incubated for 24 and 96 hours respectively at 37°C. and reduced to one fifth of the original volume by centrifugation. A mixture of these cultures was made, 10% of volume of liver lysate added, and the whole homogenized. By i/v inj. of a total dose of 200 ml. of this antigen, given either as a single dose or in three doses at 5–6 days' interval, immune serum of high quality was produced from pigs.—E.G.

Koppel, Z. & Rohárik, J. (1956). Príspevok k výskytu listeriózy na východnom Slovensku. **[Listeriosis in eastern Slovakia.]**—*Folia vet., Košice* **1**, 173-178. [In Slovak. German and Russian summaries.] **3488**

During the past 5–6 years listeriosis was diagnosed in eastern Slovakia in 3 flocks of sheep and 4 poultry establishments. Mortality was low. The organism was also isolated from muscles and organs of a calf and from an aborted bovine foetus. No cases in pigs were recorded. [See also *V.B.* **27**, 673.]—E.G.

Gray, M. L. & Thorp, F., Jr. (1957). **Perinatal infection in rabbits induced by *Listeria monocytogenes*. IV. Apparent transmission through dam's milk.**—*Zbl. VetMed.* **4**, 405-414. [In English. French, German and Spanish summaries. English summary modified.] **3489**

Erysipelothrix (*Listeria*) *monocytogenes* seemed to pass through the milk of rabbits, exposed orally a few days before or immediately after parturition, in sufficient numbers to infect the unweaned young. Of 16 new-born rabbits born to non-infected does but suckled by infected does, all died within 7 days and *E. monocytogenes* was isolated from 10. Of 11 does orally exposed immediately postpartum, one or more offspring were infected in 7 of the litters. Those which died during the first 4 days postpartum usually died from septicaemia while those which survived a few days longer appeared to have meningitis or meningo-encephalitis. There was evidence that some of the young which survived may have experienced an inapparent infection, or showed only mild symptoms with eventual apparent recovery. The public health implications of the presence of *E. monocytogenes* in cow's milk are discussed.

Berman, D. T. (1957). **The effect of bacterins containing *Pasteurella multocida* on agglutinins for brucella in cattle.**—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago*, 1956 pp. 97-103. [Author's summary modified.] **3490**

Certain commercial killed *Past. septica* vaccines stimulated the production of agglutinins for *Br. abortus* in cattle which had previously been vaccinated with Strain 19. The cross reaction was associated with the capsular polysaccharide of *Past. septica*, Types C and D. The serological and diagnostic significance of the results is discussed.

Amies, C. R. & Jones, S. A. (1957). **A description of *Haemophilus vaginalis* and its L forms.**—*Canad. J. Microbiol.* **3**, 579-590. **3491**

H. vaginalis was recovered from cases of non-specific vaginitis and urethritis, and a bacteriological study was made of a number of strains. The organism, a small Gram-negative cocco-bacillus, grew on a serum-yeast nutrient agar and it was found that 5% defibrinated sheep's blood inhibited growth. Irregular results were obtained with carbohydrate fermentation tests; all the strains isolated reduced nitrates and the oxidase test was always negative. The development of L-phase organisms in colonies of *H. vaginalis* subject to the influence of penicillin is discussed. The L-phase organisms could be transferred in serial subculture on solid medium, but inoculation of fluid without penicillin resulted in reversion to the parent

form. It is suggested that the pleuropneumonia-like organisms reported in cases of genito-urinary infection may be L forms of *H. vaginalis*.—A. GREIG.

SAKAZAKI, R. & WATANABE, S. (1956). **Taxonomical position of *Bacterium viscosum equi* (*Shigella equirulis*).**—*Jap. J. vet. Sci.* **18,** 53-57. [In English. Japanese summary.] **3492**

The authors studied 10 stock cultures and concluded, on the basis of size, bipolar staining, poor growth on nutrient agar, inhibition of growth by sodium desoxycholate and penicillin sensitivity, that the organism should be placed in the genus *Pasteurella,* probably with the Group D described by Ochi [*V.B.* **5,** p. 114]. —R.M.

RENK, W. (1956). Besondere Befunde bei der nekrotisierenden Mastitis. **[Special findings in necrotic mastitis.]**—*Mh. VetMed.* **11,** 701-703. **3493**

A brief account of the pathology of necrotic mastitis in cows caused by *E. coli*.—R.M.

FEY, H. (1956). Über Colistämme der O-Gruppe 78 mit einen neuen B-Antigen bei der Colisepsis des Kalbes. **[A strain of *E. coli* of O-group 78, with a new B antigen, from septicaemia in calves.]**—*Schweiz. Z. allg. Path.* **19,** 543-551. **3494**

In F.'s opinion the strain described was a selective pathogen for calves, and not merely a secondary invader. 35% of cases of calf diarrhoea examined by F. were caused by this strain. —R.M.

FEY, H. (1957). Bakteriologie und Serologie der Colisepsis des Kalbes. I. Serologische und biochemische Untersuchungen. II. Die Bedeutung des Colityps 78 : 80 B für die Kälberruhr. **[Bacteriology and serology of *E. coli* septicaemia in the calf. I. Serological and biochemical studies. II. The importance of Type 78 : 80 B in diarrhoea of calves.]**—*Zbl. VetMed.* **4,** 309-318 & 447-458. [English, French and Spanish summaries. English summaries modified.] **3495**

I. Serologically and biochemically, strains of *E. coli* isolated from 105 calves with septicaemia could be divided into 20 O groups, and 49 serological or biochemical types. There were 5 dominant O groups (Nos. 78, 115, 86, 15 and 117), comprising 57% of the strains; 29% belonged to Group 78. 99% of strains possessed a K antigen. F. stressed the importance of quantitative findings in demonstrating K antigen with the help of non-agglutinability of Group O.

II. Of 145 strains of *E. coli* septicaemia in calves 37·5% belonged to a single OB-Group 78: 80 B, the serological features of which are described. All the known serological and biochemical types of this OB-Group are given in a table. Among 8,600 coliform strains from healthy and sick calves (excluding calf septicaemia), healthy and emergency slaughtered cows, as well as various other animal species and babies and small children, only 8 strains of Type 78: 80 B were identified. In studying the environment in 18 herds with calf septicaemia caused by Type 78 : 80 B the same type of organism was found only in two cases in a single herd. This type is thus by no means ubiquitous, and seems to be selectively pathogenic for newborn calves, just as other strains are concerned with enteritis in infants.

The immunological and pathogenic importance of this finding is discussed; it is suggested that the useless "polyvalent" calf septicaemia sera should be replaced by a monovalent OB 78 serum and eventually by polyvalent OK serum with a good K titre .

SHEARER, G. C. (1957). **An outbreak of abortion in ewes due to *Salmonella dublin*.**—*Vet. Rec.* **69,** 693-695. [Author's summary modified.] **3496**

Eleven out of 80 ewes aborted or produced stillborn lambs. *S. dublin* was recovered from 14 of the 49 examined, and 9 others had serum titres indicative of infection. There was no scouring. The source of the infection was not found.

THAL, E. & HOLMQVIST, H. (1957). **Observations on in vivo dissociation of *Salmonella dublin*.** — *Nord. VetMed.* **9,** 421-430. [In English. German and Swedish summaries. English summary modified.] **3497**

Bacteriological examination of a cow persistently excreting *S. dublin* revealed infection in numerous lymph nodes and organs without clinical or pathological changes. Three serological variants were isolated, a serological S-form (OH-variant), an intermediate form (oH-variant), and a non-motile R-form (oh-variant). The intermediate form was shown to possess H- but no O-antigen in tube agglutination. The oh-variant was stable in culture and animal passages. Comparative pathogenicity tests in mice showed that the oH- and oh-variants were less virulent than the OH-variant.

The serologically complete OH-variant could be isolated only from the gall-bladder and intestine, sites in which the bacteria seem to be less accessible to the defensive reactions of the body. Dissociation of bacteria in the living

body, a phenomenon which appears to depend upon the varying immunogenic properties of the different organs, took place by the transformation of highly virulent OH-forms through the intermediate incomplete oH-variant to the easily phagocytized oh-form.

A factor inhibiting spontaneous agglutination was found in various sera. Although the oH- and oh-variants may escape serological identification, the diagnosis "salmonella infection" can be established with the aid of biochemical reactions and the O-1 phage.

The need to detect and eliminate salmonella carriers among farm animals by regular screening investigations is stressed.

CROWTHER, R. W. (1957). **Salmonella infection in sheep in Cyprus.**—*Vet. Rec.* **69,** 695-698. [Author's summary modified.] **3498**

Five outbreaks of *S. typhi-murium* infection in 10 flocks of sheep are described. Of the 707 animals, 68 became clinically affected and 46 died. A survey of 1,050 animals in 105 flocks failed to reveal chronic carriers. Three animals were infected experimentally, in one case with fatal results. A transient and intermittent bacteraemia was observed in the early stages. The significance of this condition in Cyprus is discussed.

MACKAY, M. E. (1957). **The identification of natural and induced bacterial antibody with the serum components in sheep.**—*Biochem. J.* **66,** 545-552. [Author's summary modified.] **3499**

The electrophoretic pattern and natural agglutinin titre against a range of H antigens of *Salmonella* were determined in sera from one flock of sheep.

No characteristic change in the electrophoretic pattern of sheep serum was demonstrable during, and for 12 months after, immunization with a bacterial vaccine. An attempt was made to isolate the natural and induced antibodies by solvent fractionation. Natural antibody to certain *Salmonella* flagellar antigens was found in fraction G 2, which was shown electrophoretically to consist of α-, β- and γ_1- globulins. This did not increase in amount during immunization with an unrelated *Salmonella* antigen. Induced antibody reached a maximum titre in serum 16–21 days after the first injection of antigen. Antibody, free from natural antibody, was present in the fraction G 3, which was substantially γ-globulin. In fraction G 2 it was mixed with natural antibody. The isoelectric points of the two antibodies appear to be different.

IMAI, N., KAMIMURA, T., SAHARA, M., TANAKA, S. & YAMAMOTO, Y. (1956). **[Studies on the variability of immune reactions in the course of *Salmonella pullorum* infection. III. Classification of infections in adult fowls.]**—*Bull. Azabu vet. Coll.* **3,** pp. 1-31. [In Japanese. Abst. from English summary.] **3500**

Four types of *S. pullorum* infection in fowls are distinguished—severe chronic, fatal septicaemic, mild, and convalescent following severe chronic infection. Ten fowls, either negative or with a low agglutitin titre (1:20), were infected by the intravenous, oral or conjunctival routes. There were no deaths from acute septicaemia. Egg-laying was affected, but males showed no symptoms. Acute bacteraemia lasted from about the 3rd to the 9th day after infection, and in a few birds the organism persisted in the tissues for at least 68 days. Agglutinin titres rose sharply on about the 6th day, and fell soon afterwards in some birds while remaining high in others. The minimum positive titre is considered to be 1:40. The tube agglutination test is considered more reliable than the rapid plate test. [See also *V.B.* **26,** 1874.]—M.G.G.

USHAKOV, A. A., MALYAVIN, A. G., ROMIN, A. B., SIZOV, I. N. & KROPINOV, S. I. (1956). **[Specific activity of pullorum antigen after storage.]** — *Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 295-298. [In Russian.] **3501**

S. pullorum antigen did not deteriorate after storage for 18 months in an unheated room at a temp. ranging from 4° to 20°C.—R.M.

ADAM, W. (1957). Über die Herstellung und Pasteurisierung von Fischmehl im Hinblick auf dessen Gehalt an Salmonellabakterien. **[Salmonella content of fish meal in relation to its manufacture and pasteurization.]**—*Berl. Münch. tierärztl. Wschr.* **70,** 49-51. [English summary.] **3502**

Of 833 samples of imported fish meal 130 (16%) contained salmonella. Possible sources of infection are fish caught in coastal waters, and contamination by human beings, birds or animals as the meal is drying in the sun. Samples of fish meal from 2 German factories contained *Proteus* organisms or spores at all stages of manufacture, which suggests that present methods of processing fish meal do not eliminate salmonella. The pasteurization of fish meal is proposed.—M.G.G.

ATKINSON, N. (1957). **Lysogenicity and lysis patterns in the salmonellas. XI. The bacteriophage grouping scheme compared with other**

schemes using bacteriophage for exact strain identification in the salmonellas.—*Aust. J. exp. Biol. med. Sci.* **35**, 1-14. **3503**

The author discussed the phage typing methods in use for *Salmonella*. The grouping scheme proposed here is the Boyd type with attempted simplification and was developed from an extensive study on the lysogenicity and lysis patterns of several salmonella serotypes recorded earlier in this series. In the proposed scheme the symbiotic phage of a strain was not actually identified but was recognized by its activity in lysogenicity tests on a series of indicator strains representing the established phage groups. The indicator strains carried different phages previously characterized as numbered types. Phage groups were stable, the simplicity of the method was comparable to that of other techniques and the scheme was shown to be of potential value in epidemiological investigations.

—K. G. Johnston.

Derzsy, D. (1956). **Incomplete brucella antibodies in bovine blood sera.**—*Acta vet. hung.* **6**, 395-399. [In English. Russian summary.] **3504**

D. applied to brucellosis the indirect complement-fixation test described by Rice [*J. Immunol.* **60**, 11. (1948)]. Tests were performed by Takátsy's technique, on plastic plates, with a spiral loop to measure test components. Nearly 400 bovine sera were examined. The indirect c.f. test detected antibody in 12 of 67 sera positive to the agglutination test and negative to the direct c.f. test, and in 3 of 309 sera negative to the agglutination and direct tests.—R.M.

I. Roepke, M. H., White, T. G., Stiles, F. C., Jr. & Driver, F. C. (1957). **Studies on a differential test for nonspecific brucella agglutination reactions in bovine serum.**—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago*, 1956 pp. 109-118. [Authors' conclusions modified.] **3505**

II. Rose, J. E. & Roepke, M. H. (1957). **An acidified antigen for detection of nonspecific reactions in the plate-agglutination test for bovine brucellosis.**—*Amer. J. vet. Res.* **18**, 550-555. [Authors' summary modified.] **3506**

I. Field studies indicate that a high percentage of bovine sera with low titres from suspected herds contain non-specific agglutinins for *Brucella*. Most of these reactions are inhibited if the pH of the serum-antigen mixture of the 1:25 dilution of the serum plate test is adjusted to 4–3·5 by the addition of concentrated acetic or lactic acid to the plate test antigen. 96 to 100% of comparable tests on 85 sera known to contain specific agglutinins were positive or not inhibited to the extent of a negative reaction at the 1:25 dilution. The preliminary field studies indicate that the acidified plate antigen test has acceptable accuracy if used only for sera with low titres from typical suspected herds, or herds containing a single reactor with no other evidence of infection. The test is not suitable for routine use. It is an aid in obtaining additional diagnostic information on certain sera.

II. The acidified antigen is prepared by adding 0·08 ml. of glacial acetic acid to 1 ml. of *Br. abortus* antigen. When 0·03 ml. of this acidified antigen is added to 0·08 ml. of serum, as in the 1:25 dilution of the plate test, the resulting mixture has a pH of 4. Preliminary results indicate that this antigen can distinguish between specific and non-specific brucella agglutinins. The mechanism of action is inhibition of the reaction rather than inactivation or destruction of the non-specific agglutinins, since neutralization of the mixture restores the agglutinating activity of the serum.

Thorold, P. W. & Holmes, C. R. (1957). **The use of the brucella milk ring test (M.R.T.) in practice.**—*J. S. Afr. vet. med. Ass.* **28**, 143-146. [Authors' summary modified.] **3507**

Over the past 3 years 2,078 animals on 93 farms in Kenya have been tested by the ring test; 20% were positive, revealing 33% of the farms to be infected. The differential test described by van Drimmelen was useful for distinguishing reactors from vaccinated animals and the haematoxylin-stained antigen from Onderstepoort gave more reliable results than the tetrazolium-stained antigen from Onderstepoort and Kabete, and was also useful in the rapid plate agglutination test.

Goode, E. R., Jr., Manthei, C. A. & Amerault, T. E. (1957). **Further studies on duration of immunity to brucellosis induced in calf-vaccinated cattle with Strain 19 vaccine.**—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago*, 1956 pp. 89-96. [Authors' summary modified.] **3508**

The "Index of infection," which is a numerical evaluation of the responses of vaccinated and unvaccinated cattle to virulent *Br. abortus*, shows more clearly the degree of susceptibility or immunity than does the percentage of infected animals. The immunity of cattle vaccinated s/c as calves with 5 ml. of Strain 19 did not decrease with age. An increase of 2 or more dilutions in the sero-agglutinin titre after

exposure was better than any other single criterion for classifying animals with localized infection.

KHRISTOFOROV, L. & VATCHEV, B. (1956). **[Pathogenicity of *Br. abortus* for pigs.]** — *Sborn. nauch. Trud. vet. Inst. Minist. Zemed., Sofia* **6,** 187-192. [In Bulgarian. English and Russian summaries.] **3509**

Three out of 4 young pigs developed high titres of antibodies to *Br. abortus* after being fed for 46 days on milk from infected cows. One pig developed paresis and another orchitis, while the third remained normal.—R.M.

ANDERSON, W. A. & DAVIS, C. L. (1957). **Nodular splenitis in swine associated with brucellosis.**—*J. Amer. vet. med. Ass.* **131,** 141-145. [Authors' summary modified.] **3510**

Eighteen cases of nodular splenitis in pigs are described, 10 of which yielded *Brucella* organisms, classified in 6 cases as *Br. suis*. The P.M. and histopathological findings were comparable in all cases. It is suggested that, in the absence of other lesions, the finding of a focal, nodular splenitis in pigs justifies a presumptive diagnosis of brucellosis. Acid-fast bacilli were not demonstrable in direct smears or tissue sections of these spleens, and none of the g. pigs injected with splenic material developed TB.

BOGDANOV, M. I. (1955). **[Significance of the peripheral nerve receptors in the development of immunity to brucellosis.]**—*Trud. buryat-mongol. zootech.-vet. Inst.* No. **9,** pp. 105-111. [In Russian.] **3511**

Inoculation of g. pigs with live *Br. suis* Strain 22 protected one-third of them from subsequent infection with *Br. abortus*. When 0·5–1 mg. saponin was added to each dose of vaccine, the pH of which was 8–8·6, 95% of vaccinated g. pigs were immune.—R.M.

MAYER, H. & OSTERTAG, H. G. (1957). Die Eignung 15 proz. NaCl-Lösung für die Blutserum-Agglutination zur Diagnostik der Schafbrucellose. **[Use of 15% sodium chloride solution in the agglutination test for brucellosis in sheep.]**—*Mh. Tierheilk.* **9,** 165-170. **3512**

Various diagnostic tests were performed on 2,646 sheep in 21 flocks, of which 11 flocks (1,691 sheep) were infected. Agglutination tests using 15% NaCl soln. gave 19·2% more reactors than the agglutination test with 5% NaCl soln. The reactors included some animals which were positive to the c.f. test but negative to the agglutination test with 5% saline. The modified agglutination test could not, however, replace the intradermal allergic test: presumably both should be used together. The reaction of sheep to the various tests during artificial infection was studied, and details are given of two sheep. [See also *V.B.* **25,** 3952.]—R.M.

I. PALTRINIERI, S., BIGGI, P. & FARINA, R. (1956). Brucellosi ovina ed autosterilizzazione spontanea. Ricerche sperimentali. **[Spontaneous recovery of sheep experimentally infected with *Brucella melitensis*.]** — *Ann. Fac. Med. vet. Pisa* **9,** 251-263. [English and French summaries.] **3513**

II. BIGGI, P. (1956). Indagini sulla batteriemia brucellare in pecore sperimentalmente infettate. **[*Brucella melitensis* in the blood of experimentally infected sheep.]**—*Ibid.* 264-270. [English and French summaries.] **3514**

III. BIGGI, P. (1956). Eliminazione delle brucelle con il latte in pecore sperimentalmente infettate. **[*Brucella melitensis* in the milk of experimentally infected sheep.]**—*Ibid.* 271-277. [English and French summaries.] **3515**

IV. FARINA, R. & BIGGI, P. (1956). Sulla eliminazione delle brucelle per via vaginale in pecore sperimentalmente infettate. **[*Brucella melitensis* in the vaginal secretions of experimentally infected sheep.]**—*Ibid.* 278-283. [English and French summaries.] **3516**

V. BIGGI, P. & SESSI, P. (1956). L'isolamento delle brucelle dai vari organi e liquidi organici di feti ovini. **[*Brucella melitensis* in the organs and fluids of ovine foetuses.]**—*Ibid.* 284-286. [English and French summaries.] **3517**

VI. BIGGI, P. (1956). Il comportamento della sieroagglutinazione in ovini sperimentalmente infettati con br. melitensis. **[Serum agglutination test on sheep experimentally infected with *Brucella melitensis*.]**—*Ibid.* 287-311. [English and French summaries.] **3518**

VII. SESSI, P. (1956). Comportamento della reazione allergica in ovini sperimentalmente infettati di brucellosi. **[Allergic reaction in sheep experimentally infected with *Brucella melitensis*.]**—*Ibid.* 312-323. [English and French summaries.] **3519**

I. Young pregnant and non-pregnant ewes were experimentally infected by simultaneous s/c inj. and conjunctival sac instillation of 10^6 virulent *Br. melitensis*. Of 18 pregnant animals 16 aborted 28–95 days after infection and 2 gave birth to healthy lambs. The non-pregnant ewes were killed at varying intervals from 52 to 206 days after infection; the pregnant ones were killed 60–180 days after abortion or parturition. Bacteriological examination of 19 lymph nodes

and 7 organs (spleen, liver, kidney, lung, udder, uterus and bone marrow) revealed that after a sexual rest of 6 months some of the sheep still harboured the organism.

II. In experimentally infected virgin ewes from areas free from brucellosis the organism was demonstrable in the blood for 30–45 days. Virgin ewes from areas where brucellosis is endemic were resistant. It is considered that this resistance is elaborated through contact since the early days of life; it does not affect serological and allergic reactions; and it breaks down when the animals become pregnant.

III. Milk samples from 10 of the 18 pregnant ewes referred to in I were subjected to biological and bacteriological tests. Of 8 sheep which aborted in their first pregnancy 7 excreted the organism in the milk continuously for periods up to 6 months. It was observed that the organism was more commonly present in the milk of animals with a high agglutinating titre. No clinical changes were observed in the mammary glands of excretors. Milk samples from the other 2 sheep, which had lambed normally, did not contain brucella.

IV. Vaginal smears were taken from 63 artificially infected ewes and 357 cultures were made. The organism was not demonstrable in non-pregnant animals while it was isolated from 17 of 18 pregnant ones. In the latter brucella was present in the vaginal discharge at abortion or parturition and persisted for 21 days except in one animal in which it persisted for 74 days after abortion.

V. The organism was isolated from the fourth stomachs and lungs of 11 of 14 aborted foetuses of experimentally infected sheep; next, in order of frequency, were the kidneys, peritoneal exudate, spleen and pleural exudate, liver.

VI. Antibody formation was demonstrable 5 days after experimental infection in: 95% of sheep from a brucellosis-free area giving negative serological and allergic reactions (the titres assumed a parabolic curve reaching the peak on the 43rd day); 73·7% of sheep from an infected area with negative serological and allergic reactions (the titres were not as regular as in the previous group). In pregnant sheep serological reactions were similar to those in the first group. In 7 of 17 sheep there was an increase in titre 15–30 days after the end of pregnancy. There was no correlation between agglutination titres and isolation of brucella from the blood, milk, vaginal discharge, organs or lymph nodes.

VII. The intrapalpebral brucellin test was performed on 61 sheep at different periods after experimental infection. At 22 days 10 showed positive, 37 doubtful and 14 negative reactions. At 8 weeks most of the animals tested were positive and remained so until the 12th—17th week after which reactions were weaker though they still occurred at the 26th week.—T.E.G.R.

I. Gdovin, T. (1956). Dalšie poznatky klinického o experimentálneho štúdia infekčnej epididymitídy baranov. [**Clinical and experimental study of infectious epididymitis in rams.**]—*Folia vet., Košice* **1,** 311-321. [In Slovak. German and Russian summaries.] **3520**

II. Bogdan, J. & Belák, M. (1956). Príspevok k patomorfológii infekčnej epididymitídy baranov na strednom Slovensku v zrovnaní s patomorfológiou niektorých orgánov experimentálne infikovaných býkov, kancov a morčiat. [**Pathological study of ovine epididymitis in Slovakia. Examination of some organs from experimentally infected bulls, boars and g. pigs.**] — *Ibid.* 323-334. [In Slovak. German and Russian summaries.] **3521**

I. P.M. lesions in rams from infected flocks, rejected for their breeding performance, were similar to those seen in rams with clinical epididymitis. The disease was also diagnosed in two yearling rams from an infected flock. Similar lesions were seen in 2 male goats and a bacterial strain resembling that previously isolated [*V.B.* **26,** 1575 & **27,** 418] was isolated from one of them. Clinical examination of 5 flocks showed that in some up to 51% of the rams were infected.

Following s/c inj. with a suspension of infected epididymis a ram developed the disease within 49 days. The disease was also produced in healthy rams by housing them with infected ones. Rams, whether infected naturally or experimentally, repeatedly yielded negative serological reactions.

Two bulls, 2 boars and 3 rams experimentally infected with one strain isolated from field cases yielded positive serological tests, whereas 2 rams infected with another strain gave negative reactions.

II. P.M. examination was carried out on organs of 42 rams, 2 goats, 2 bulls, 2 boars and 6 g. pigs, infected with the organism of ovine epididymitis. There was exudative periorchitis and necrotic epididymitis, mainly in the cauda epididymis, with fibrosis, and testicular atrophy. Lesions were not confined to the genital system. In the spleen there were sub-capsular haemorrhages and hyperplasia. Purulent, necrotic lymphadenitis of regional, but often also of other

lymph nodes, was present. Haemolymph nodes around the aorta were enlarged. There was focal necrosis and abscess formation in liver, lungs, spleen and occasionally also in muscles. Other organs were rarely involved. There was also hyperplasia of reticulo-endothedial cells in the spleen, lymph nodes, haemolymph nodes, and liver. No specific lesions were seen in the digestive system. Lesions in bulls, boars and g. pigs were similar. Studies on differential diagnosis are in progress.—E.G.

I. GOLOSOV, I. M. (1956). **[Aetiology of bursitis and orchitis in reindeer.]** — *Trud. nauchno-issled. Inst. sel'sk. Khoz. krainego Severa* **3,** 97-107. [In Russian.] **3522**

II. SEROV, V. M. & SEROVA, N. M. (1956). **[Bursitis in reindeer.]**—*Ibid.* 108-111. [In Russian.] **3523**

I & II. Multiple bursitis, tendovaginitis, and in some cases arthritis and orchitis, occurred in reindeer in the Far North of the U.S.S.R. It was identified as brucellosis by serological and pathological findings; work on isolation of the causal organism is in progress.—R.M.

IVANOV, M. M. & LEVINA, I. G. (1956). **[Study of the antigenic and immunogenic properties of brucella strains.]**—*Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 123-137. [In Russian.] **3524**

Eight strains were examined. *Br. suis* Strain 55 was weakly agglutinogenic, of low virulence, and had immunogenic properties. The immunizing dose for g. pigs was 10 million organisms. Eight sheep inoculated with 15,000 million organisms were immune to infection with *Br. melitensis* 3½ months later. The immunogenic properties of *Br. abortus* Strain 19 were also studied in a small number of sheep.—R.M.

RISTIC, M., GALTON, M. M., MCRAE, L., SANDERS, D. A. & STEELE, J. H. (1957). **Experimental leptospirosis in bovines. I. Establishment of infection with *Leptospira sejroe*.**—*J. infect. Dis.* **100,** 228-240. [Authors' summary modified.] **3525**

The clinical, bacteriological, serological, haematological and gross pathological response of 9 calves to experimental infection with *L. sejroe* was studied. Fever, sluggishness, diarrhoea, stiffness of the joints, and malaise were generally observed, with individual variations in degree and persistence. Leptospiraemia persisted from 1 to 4 days. Leptospires were isolated from the kidneys of one calf and demonstrated in silver stained kidney preparations in this and in 2 others. The earliest demonstrable microscopic tube agglutinin titre for *L. sejroe* (1:64) occurred 6 days after infection. The max. titre (1:16,384) was reached between the 8th and 11th days. Thereafter, the titre gradually receded but was still demonstrable (1:32 to 1:256) when the animals were slaughtered. Slight transitory anaemia and leucopenia during the leptospiraemic stage were the only haematological abnormalities. With the exception of one sample, when considerable increase in blood urea nitrogen was noted, blood sugar and urea remained within normal limits. The maior lesions were interstitial nephritis, degeneration of the epithelial lining of Bowman's capsule and convoluted tubules of the kidney, and focal necrosis of the liver. These findings along with field serological data indicate that *L. sejroe* may be an additional aetiological agent of bovine leptospirosis. Controls in contact with the infected calves remained clinically, bacteriologically and serologically negative.

SALMINEN, A. (1956). **Studies on the occurrence of various leptospiral types in Finland.**—*Ann. Med. exp. Fenn.* **34,** Suppl. No. 5, pp.77. **3526**

S. reviewed the literature on leptospirosis in Finland. Of 37 canine sera 4 were positive for *L. icterohaemorrhagiae,* 2 for *L. bataviae,* and one for *L. canicola.* Of 406 pigs 43 were positive for *L. hyos,* 11 for *L. bataviae,* 9 for *L. poi,* 6 for *L. pomona,* 6 for *L. sejroe* and 5 for *L. icterohaemorrhagiae.* Of 303 cattle 5 reacted to *L. sejroe,* 2 to *L. poi* and 2 to *L. bataviae.* Of 95 horses 15 were positive for *L. bataviae,* 10 for *L. poi,* 9 for *L. sejroe,* 5 for *L. icterohaemorrhagiae* and 4 for *L. hyos;* 81 strains of *L. icterohaemorrhagiae, L. sejroe, L. bataviae,* and *L. poi* were isolated from the kidneys of 505 rodents.—M.G.G.

FLIR, K. (1956). Die Leptospirose-Nephritis des Hundes. Zugleich ein Beitrag zur Frage der serösen Nephritis. **[Leptospiral nephritis in dogs.]**—*Mh. VetMed.* **11,** 693-701. **3527**

Pathologically, acute leptospiral nephritis was a serous inflammation, characterized by glomerulitis, vasculitis and interstitial plasmorrhagia. The histopathology and pathogenesis were discussed and compared with chronic sclerotic leptospiral nephritis.—R.M.

KATSURA, S. & YOSHIDA, R. (1957). Über die antileptospirären Wirkungen von Tropolon-Verbindungen. **[Antileptospiral action of Tropolone compounds.]** — *Zbl. Bakt. I.* (*Orig.*) **168,** 289-293. [English, French and

Russian summaries. English summary modified.] **3528**

Tropolone [2-hydroxy-2,4,6-cycloheptatrien-1-one] and Hinokitiol [2-hydroxy-4-isopropyl-2,4,6-cycloheptatrien-1-one] had a stronger anti-leptospiral effect than other Tropolone compounds tested. They were active at all stages of leptospiral development. In the introductory stage of development antibiotics were more effective, but in later stages their action was inferior to that of Tropolone and Hinokitiol.

GÄNGEL, G. & THEMANN, H. (1956). Elektronenmikroskopische Untersuchungen über die Entwicklungsstadien der Leptospiren. **[Electron microscopical study of the developmental stages of leptospires.]**—*Arch. Hyg., Berl.* **140,** 559-568. **3529**

A morphological study of *L. icterohaemorrhagiae, L. grippo-typhosa, L. sejröe, L. canicola* and *L. mitis,* with special attention to the formation of "loops" and "nests."—R.M.

GOUDIE, J. G. & DUNCAN, I. B. R. (1956). *Clostridium welchii* **and neutralising substances for** *Clostridium welchii* **alpha-toxin in faeces.**—*J. Path. Bact.* **72,** 381-392. **3530**

Large numbers of *Cl. welchii,* Type A, were found in many of the specimens of faeces from normal human beings and from patients with various diseases. In some specimens α-toxin-neutralizing activity was demonstrated, but not always in those which contained many *Cl. welchii.* This may explain why in some outbreaks of food-poisoning only a small proportion of people develop symptoms.—M.G.G.

KAGAN, F. I. & KOLESOVA, A. I. (1956). **[Polyvalent aluminium hydroxide vaccine against bradsot and enterotoxaemia of sheep.]** — *Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 211-222. [In Russian.] **3531**

Tests on sheep indicated that an aluminium hydroxide vaccine prepared from *Cl. septicum, Cl. oedematiens* and *Cl. welchii* Type B was of practical value against bradsot (braxy) and lamb dysentery. Field trials have not yet been carried out.—R.M.

KALICH, J. (1957). Tetanus als lokale und allgemeine Infektion. **[Tetanus as a local and generalized infection.]**—*Zbl. VetMed.* **4,** 415-430. [English, French and Spanish summaries. English summary modified.] **3532**

In mice, infection with a very small dose of tetanus spores was not always confined to the site of inoculation. Under certain circumstances *Cl. tetani* could also reach the organs *via* the blood stream, sometimes within half an hour of inoculation. Various mixed infections facilitated invasion of the organs from the site of infection. Under certain circumstances tetanus could also develop from the alimentary tract. In certain mixed infections the usual doses of tetanus antitoxin have little effect. It is of advantage to administer at the same time specific therapy directed against the accompanying organisms.

KALICH, J. (1957). Phagozytose von Tetanus-Sporen. **[Phagocytosis of tetanus spores.]**—*Zbl. VetMed.* **4,** 431-446. [English, French and Spanish summaries. English summary slightly modified.] **3533**

Tetanus spores are positively chemotactic towards phagocytes. Monocytes are the most active against spores, but polymorphs also play a part. In certain mixed infections the accompanying organisms are negatively chemotactic towards phagocytes, and so the tetanus spores are able to germinate. Toxin-producing tetanus bacilli exert a negative chemotaxis. Tetanus toxin enters the c.n.s. from the blood stream more rapidly when the blood-brain barrier has been made more permeable. Permeability of this barrier for tetanus toxin can be increased more rapidly by the metabolic products of certain accompanying organisms than by tetanus toxin alone. The incubation period depends on the degree of damage to the blood-brain barrier.

DUFF, J. T., KLERER, J., BIBLER, R. H., MOORE, D. E., GOTTFRIED, C. & WRIGHT, G. G. (1957). **Studies on immunity to toxins of** *Clostridium botulinum.* **II. Production and purification of type B toxin for toxoid.**—*J. Bact.* **73,** 597-601. [Authors' summary modified.] **3534**

Cl. botulinum Type B toxin was produced in a medium composed of "trypticase," yeast extract, cysteine hydrochloride, and glucose. The cultures contained 2×10^6 mouse intraperitoneal LD_{50} per ml. or more. The toxin was precipitated from the culture by acidification at pH 4·5, and the precipitate was washed with water. Toxin was extracted from the washed precipitate with 0·05 M calcium chloride soln. at pH 6 and at 30° to 35°C. The toxin was precipitated from the extract by acidification at pH 3·7, dissolved in 0·1 M phosphate buffer at pH 6·8 and precipitated with ethanol to 15% concentration at −5°C. The purified toxin was soluble in 0·2 M succinate buffer, pH 5·5, or 0·1 M phosphate buffer, pH 6·8, had a specific activity of 262×10^6 mouse LD_{50} per mg. N, and was essentially homogeneous when examined in the analytical ultracentrifuge. The fractionation

procedures were reproducible and could be applied on a scale suitable for the routine isolation of toxin for conversion to toxoid.

EIDE, G. W. & HELLE, O. (1957). **Studies on infertility and abortion in sheep and goats in Norway. II. Genital vibriosis in sheep.**—*Nord. VetMed.* **9,** 337-361. [In English. German and Norwegian summaries.] **3535**

A description is given of the investigation of a spontaneous outbreak of vibrionic abortion in a flock of 142 breeding ewes. 18 ewes aborted between the 92nd and 140th day of pregnancy. Those which aborted before the 110th day produced stillborn lambs. Lambs born later were alive but soon died. *Vibrio fetus* was isolated from almost all lambs; vaginal mucus of one fifth of virgin gimmers, and of pregnant ewes which later lambed normally; foetal fluid of two ewes and stomach contents of one new-born lamb; and semen of rams which had served the ewes which aborted first. Since the results indicate routes of infection other than coitus the authors stress the importance of isolation and disinfection following the first abortions. A herd of cattle, in contact with the infected flock, remained normal and uninfected.

—H. SCOTT MCTAGGART.

FORSYTH, B. A. (1957). **The treatment of contagious footrot in sheep by the topical application of a "Cetavlon" tincture.**—*Aust. vet. J.* **33,** 157-161. [Author's summary modified.] **3536**

Laboratory tests on penned animals indicated that cetrimide applied directly to pared feet cured contagious foot rot of sheep. In field trials under adverse conditions 72·3% of 282 infected feet were completely cured by one treatment. These figures compared favourably with concurrent trials with 10% chloromycetin, in which 73·1% of 134 feet were cured by a single teratment. Evidence is also presented that the application of 20% cetrimide to infected feet 1 hour before they were immersed in 10% formalin doubled the percentage of cures when compared with a single treatment of 10% formalin alone.

TOOP, C. R. (1957). **Progress in the control of footrot.**—*J. Dep. Agric. W. Aust.* **6,** 253-255. **3537**

The progress made in the official campaign to control and eradicate foot rot of sheep is described. Control measures employed consist of the regular inspection of markets supported by inspection of individual flocks. All affected properties found are quarantined, and no sheep can be moved from them except for slaughter at approved centres. Emphasis is placed upon eradication in the dry summer months. Official assistance is given to flock owners and the established methods of eradicating the disease are followed. Affected sheep are either slaughtered or their feet are pared and treated by repeated immersions in formalin footbaths or by painting with chloromycetin or cetrimide, both of which have proved effective. Follow-up inspections are made and the flock must remain free from the disease throughout the following winter and spring before it is released from quarantine. Since the campaign began 7 years ago 556 affected flocks have been found and 474 of them freed from the disease. With few exceptions they have remained free.—D. F. STEWART.

ENRIQUE PÉREZ, J., PADILLA, E. A., RIVERA ANAYA, J. D. & TORRECH, A. (1956). **Bacterial flora of foot rot : Report of findings in 100 cattle.** — *J. Agric. Univ. P.R.* **40,** 118-124. [In English. Spanish summary.] **3538**

Material was collected from 50 recent cases of foot rot in cattle and 50 old cases (of more than 2 weeks' duration). *F. necrophorus* was isolated from 6·4% of samples; *C. pyogenes* from 10%; clostridia from 26·8%; *Bacteroides melaninogenicus* from 10%; *Ps. pyocyanea* from 3%. Streptococci, staphylococci and *B. cereus* were common.—R.M.

THOMAS, L. (1956). **The role of epinephrine in the reactions produced by the endotoxins of gram-negative bacteria. I. Hemorrhagic necrosis produced by epinephrine in the skin of endotoxin-treated rabbits.**—*J. exp. Med.* **104,** 865-880. **3539**

ZWEIFACH, B. W., NAGLER, A. L. & THOMAS, L. (1956). **The role of epinephrine in the reactions produced by the endotoxins of gram-negative bacteria. II. The changes produced by endotoxin in the vascular reactivity to epinephrine, in the rat mesoappendix and the isolated, perfused rabbit ear.**—*Ibid.* 881-896. **3540**

I. & II. T. postulated that endotoxin has the property of altering the reactivity of terminal arterioles to epinephrine and that this property may be the basis of many of the patho-physiological effects of endotoxin. In skin tests on rabbits the endotoxins exerted an effect on the blood vessels which altered their reactivity to epinephrine to such an extent that this hormone became a necrotising agent. It could be held that the actual necrotising agent was the endotoxin, rather than epinephrine; it might be held that the lesion caused by intravenous endotoxin and intradermal epinephrine was due to the

trapping of circulating endotoxin in the area of vascular stasis created by epinephrine, and that a similar situation is created by the local injection of a mixture of the two substances. This would, however, require the assumption that the levels of circulating endotoxin remain fairly constant for as long as 4 hours after i/v injection. On the contrary, it appears that most, if not all, of the i/v injected endotoxin is cleared from the circulating blood within a few min. after injection and it is difficult to believe that a sufficient amount persists after an hour or more. The skin lesions were prevented by pretreatment with cortisone, dibenzylene and chlorpromazine, but not by heparin or nitrogen mustard. They were prevented by rendering rabbits "tolerant" by repeated injections of sublethal amounts of endotoxin. In experiments *in vivo* on exteriorized mesentery of rats and *in vitro* on perfusion of the isolated rabbit ear, there was a direct effect of endotoxin on the reactivity of small blood vessels to epinephrine. After local application of epinephrine in concentrations that had little or no effect on control tissues, small doses of endotoxin caused severe and prolonged vasoconstriction, involving both arterioles and venules. After exposure to endotoxin, the small veins, normally the least reactive of the terminal vessels to epinephrine, become more sensitive than precapillary arterioles, a mechanism for impeding capillary circulation and pooling blood within the collecting vessels thus being provided. Increasing the dosage of endotoxin shortened the stage of epinephrine reactivity and there was a stage of increasing hypo-reactivity. During this time there was petechiation along capillaries and venules, especially at the sites of topical application of epinephrine. With lethal doses of endotoxin the terminal arterioles and venules failed to respond to epinephrine, the larger arteries and veins yielded increased response and, as a result, stagnant blood became pooled in all capillaries and venules, the larger vessels becoming contracted to narrow thread-like structures.

The authors suggested that comparable reactions in rabbit skin subjected to the combined effects of endotoxin and epinephrine may represent aspects of a basic mechanism for tissue damage. The reactions here reported may have a bearing on other effects of endotoxin, notably on shock. [This paper may be of interest to those studying "oedema disease" of pigs.]

—W.A.P.

VRTIAK, J. (1956). Hromadné ochorenie kačiat na východnom Slovensku za príznakov zápalov infraorbitálnych sínusov. **[Outbreak of sinusitis in ducklings in Slovakia.]**—*Folia vet., Košice* **1,** 196-197. [In Slovak.] **3541**

In eastern Slovakia, 1,250 ducklings up to 21 days old had died within two weeks of a respiratory disease, a feature of which was inflammation of the infraorbital sinuses. On this farm hatchability of duck eggs was very low. Infected ducklings died within 2 days of appearance of symptoms. Old ducks, fowls and turkeys housed nearby remained healthy.

Koppel, discussing the paper, stated that he had examined 10 carcasses and 12 live ducklings from this farm, and had isolated *S. typhimurium* from organs and *Pasteurella* and streptococci from lesions in sinuses. *Haemophilus* was not found. Use of sulphonamides and aureomycin reduced the daily mortality rate from 150–200 to 2–7 within a few days. K. considered *S. typhi-murium* to be the cause of the high mortality.—E.G.

MALYAVIN, A. G. (1956). **[Polyvalent vaccine against paratyphoid, pasteurella and diplococcal infection in piglets, and its use in field trials.]**—*Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 266-282. [In Russian.] **3542**

Pasteurellosis caused 70% of deaths of piglets from infectious disease; paratyphoid accounted for 21·4%, streptococcal (diplococcal) septicaemia for 6·8%, and *E. coli* infection for 1·8% of deaths. Vaccine was prepared from formolized mixed broth cultures of suitable strains of *S. cholerae-suis,* pasteurella and streptococcus, containing potash alum and calcium chloride as adjuvants. Piglets were each given [at unstated intervals] 3 inoculations of 3–5 ml. of the vaccine. During the first four months after vaccination, 1·1% of 19,705 piglets died, compared with 7·1% of 13,964 unvaccinated controls.—R.M.

FISHER, M. W. (1957). **Synergism between human gamma globulin and chloramphenicol in the treatment of experimental bacterial infections.**—*Antibiot. & Chemother.* **7,** 315-321. [Spanish summary p. 342. Author's summary modified.] **3543**

Pooled human gamma globulin synergized chloramphenicol in experimental infections in mice caused by species of staphylococci, streptococci, *Pseudomonas,* and *Proteus.* In *Staph. aureus* infection, as little as 0·02 ml. of gamma globulin soln./kg. of body wt. was synergic.

BENITO TRUJILLO, M. (1956). Méthode sûre, rapide et simple de coloration des spores bactériennes. **[A simple, rapid method for**

staining bacterial spores.] — *Ann. Inst. Pasteur.* **91,** 421-422. **3544**

An account of a modification of the method described by Gray [see *V.B.* **11,** p. 809]. A smear, fixed by heat, is treated for 3 min. with warm 0·5% malachite green, washed in running water, treated for 1 min. with cold 0·25% basic fuchsin, washed again, and dried. Spores stain green, and bacilli red. The basic fuchsin can be replaced by 1% phloxine.—M.G.G.

SUTER, L. S. (1957). *In vitro* **development of resistance of** *Actinomyces bovis* **to antibiotics.** — *Antibiot. & Chemother.* **7,** 285-288. [Spanish summary p. 339. Author's summary modified.] **3545**

Three strains of *Actinomyces bovis* did not develop resistance *in vitro* to erythromycin, carbomycin or penicillin over a period of 16 weeks. But there was a slow, moderate development of resistance to oxytetracycline, tetracycline, chloramphenicol, and dihydrostreptomycin.

MORTELMANS, J. & VERCRUYSSE, J. (1956). Opmerkingen bij de diagnose van Runderstreptothricose. **[Diagnosis of cutaneous streptothricosis in cattle.]**—*Bull. agric. Congo belge* **47,** 1291-1297. [In Flemish. French summary.] **3546**

For diagnosis, a pea-sized lesion was pinched off the skin of the affected animal, and the inner surface of it was pressed very firmly into a drop of water on a slide. *Streptothrix* was not found unless strong pressure was applied in making smears. Smears were dried in air and fixed by heat or absolute alcohol, then stained for 5 sec. with fuchsin soln., diluted 1:20 with water. After drying, smears were examined under an immersion lens.—R.M.

EIKMEIER, H. (1957). Die Behandlung der Streptotrichose des Hundes mit Penicillin-Streptomycin. **[Treatment of streptothricosis in dogs with penicillin and streptomycin combined.]** — *Dtsch. tierärztl. Wschr.* **64,** 303-304. **3547**

Two cases of peritonitis, and one of skin abscesses and fistulae, in dogs and due to *Nocardia canis,* were successfully treated with streptomycin 1 g./day (i/p in the peritonitis cases) and pencillin 0·4–0·5 megaunit/day i/m. E. emphasized that treatment must be carried in high dosage for rather longer than in the more common infections (*i.e., for* 10–15 days), to avoid relapse, such as was seen in the first case, when treatment was discontinued after only 7 days, and in yet another case (pleurisy due to the same organism) treated for 4 days with penicillin only.—G. P. MARSHALL.

RICH, M. A. & STERN, A. M. (1957). **The pathogenicity of** *Dematium nigrum* **for mice.**—*Canad. J. Microbiol.* **3,** 607-610. **3548**

A neurological syndrome characterized by paresis of the right foreleg, tendency to circle to the right, general irritability followed by incapacitation of the right side and death, resulted from the injection of a suspension of *Dematium nigrum* into the tail veins of mice. All four strains tested produced this response but *Pullularia pullulans* and *Cryptococcus nigricans* which were used as controls did not. The correlation between mouse virulence and human pathogenicity of other fungi suggested to the authors that care should be taken in handling *Dematium nigrum.*—A. ROBERTSON.

ANON. (1956). **Osseous reaction to indigenous method of vaccination against bovine pleuropneumonia.**—*Bull. epiz. Dis. Afr.* **4,** 243. **3549**

Photographs of two bovine skulls illustrate large bony outgrowths in the nasal region, resulting from the implantation of infective lung, a method of vaccination practised by Africans. —R.M.

NELSON, J. B. (1957). **The enhancing effect of murine hepatitis virus on the cerebral activity of pleuropneumonia-like organisms in mice.** —*J. exp. Med.* **106,** 179-190. [Author's summary modified.] **3550**

Pleuropneumonia-like organisms (PPLO) of the catarrhal type were isolated from the brain of a Swiss mouse during the cranial passage of mouse hepatitis virus Strain C. Cranial injection of the PPLO alone into Swiss and Princeton unweaned mice yielded a meagre growth of the organisms in the brain, with no pathogenic change.

The growth of both catarrhal and conjunctival strains of PPLO in the brains of Swiss mice was greatly enhanced by the simultaneous injection of Strain C virus. "Rolling" was not a characteristic sign before autopsy. Brain sections regularly showed a vigorous leucocytic response, commonly accompanied by the destruction of nerve cells in the anterior horns of the cerebrum. Injected into Princeton mice together with the virus, the organisms barely survived and were inactive. The highly virulent Princeton strain of virus enhanced the growth and pathogenicity of PPLO in the brains of Princeton, but not of Swiss mice. The behaviour of PPLO in the brain was likewise affected by

the presence of agar. In comparison with the effect of the virus, the enhancement was reduced in both strains of mice and was not accompanied by outward signs of nervous disorder. Hydrocephalus which often followed injection of the PPLO-agar mixture was also produced by agar-broth alone.

CRAWLEY, J. F. & FAHEY, J. E. (1957). **The use of the hemagglutination-inhibition test for the control of PPLO infection in poultry.**—*J. Amer. vet. med. Ass.* **130,** 187-190. **3551**

Using this test, breeding flocks have been established which are free from infection with pleuropneumonia-like organisms. It is essential to use a stable, standardized antigen. Birds should be tested when 12 weeks old, and at intervals of 3 months thereafter. False positive reactions may occur in adult birds with Newcastle disease or infectious bronchitis, but the titres are low and disappear within a month.

—M.G.G.

ZOLLI, Z., JR., GALLIAN, M. J., SHEA, G. S. & PRICE, K. E. (1956). **An *in vitro* method for determination of antibiotic sensitivity of avian pleuropneumonia-like organisms.**—*J. Bact.* **72,** 720. **3552**

Since turbidimetric methods of growth assay are not widely applicable to pleuropneumonia-like organisms, the authors devised a simple *in vitro* method essentially involving fermentation of maltose, without turbidity, which gave readily reproducible results in determining the antibiotic sensitivity of a number of PPLO strains.—G. P. MARSHALL.

ADLER, H. E. & YAMAMOTO, R. (1957). **Pathogenic and nonpathogenic pleuropneumonia-like organisms in infectious sinusitis of turkeys.**—*Amer. J. vet. Res.* **18,** 655-656. [Authors' conclusions modified.] **3553**

Two strains of pleuropneumonia-like organisms were isolated from sinus exudate of a turkey with sinusitis. One strain was readily propagated on artificial medium and was not pathogenic for turkeys and chickens. The second strain did not grow readily on serum-enriched agar but was capable of producing disease. The possibility of virus aetiology was not supported by cultural and animal infectivity studies.

QURESHI, S. H. (1956). **Bacteriology of chicken semen before and after treatment with antibiotics.**—*Pakist. J. sci. Res.* **8,** 116-121. **3554**

Q. confirmed the findings of Smith [*V.B.* **20,** 785], except that he did not find diphtheroid organisms. The inhibitory action of oxytetracyline, polymyxin and streptomycin on the bacterial flora of cockerel semen was reported.

—R.M.

See also absts. **3778** (preservation of bacteria); **3783** (report, Lister Institute); **3784** (report, Northern Rhodesia); **3785-3786** (reports, Southern Rhodesia); **3787** (report, Basutoland); **3788** (report, Fiji); **3789** (report, Somaliland); **3791** (book, control of bovine TB.).

DISEASES CAUSED BY PROTOZOAN PARASITES

NIGERIA. (1957). **West African Institute for Trypanosomiasis Research. Annual Report 1956.** [NASH, T. A. M.] pp. 40. Zaria, Nigeria: Gaskiya Corporation. [Items of veterinary interest pp. 11-22.] **3555**

Investigations are being conducted on the nature of the immunity of local breeds of cattle and game animals. This report gives an account of a resumed investigation into the nature of the tolerance of N'Dama cattle to trypanosomal infection. It is hoped to extend the work to cover other breeds of cattle, as a better understanding of the underlying factors which contribute to immune reactions may be of considerable importance.

Previous work at the National Institute for Medical Research, London, showed that the addition of cod-liver oil to the diet has a repressive action *in vivo* upon the rate of multiplication of several blood protozoa, including *T. congolense* and *T. vivax*.

Investigation is continuing on the prophylactic activity of suramin complexes against *T. congolense* in rats and mice. The results are shown in tabular form. Throughout these trials the challenge was administered by laboratory-reared *G. palpalis*, the infection rate of which had been raised to 90—100% by multiple feeds upon animals heavily infected with *T. vivax*. Drug trials on ethidium bromide-suramin complex were planned for the period November 1st, 1956, to 31st March, 1957.

Experimental chemotherapy of *T. simiae* in splenectomized rabbits infected by syringe-passage of blood from a pig cyclically infected by wild *G. morsitans* in the laboratory was studied. The results given in tabular form suggest that ethidium bromide, "cinnoline 528" and suramin were worth a further trial. Experiments were also carried out on chemotherapy and chemoprophylaxis of *T. simiae* infection in pigs.—D. S. RABAGLIATI.

BAKER, J. R. & ROBERTSON, D. H. H. (1957). **An experiment on the infectivity to *Glossina morsitans* of a strain of *Trypanosoma rhodesi-***

ense **and of a strain of** *T. brucei*, **with some observations on the longevity of infected flies.** — *Ann. trop. Med. Parasit.* **51,** 121-135. [Authors' summary modified.] **3556**

The two species of trypanosomes did not differ significantly in their ability to infect *G. morsitans morsitans*. Male and female *G. morsitans* did not show any significant difference in their ability to support gut infections for 7 or more days, or to develop salivary-gland infections. Infection did not appear to shorten the life of the flies. On the average, female flies lived longer than males. The greater longevity of some female flies was associated with their ability to support salivary-gland infection. It was not possible to prove this statistically. Neither the morphology nor the intensity of the parasitaemia in the infecting mammal was obviously related to the infection rates in the flies. Examination of the flagellates extruded in the 'saliva' of the flies supported the view of Lewis & Langridge (1947) that all stages of development, excluding the metacyclic trypanosomes, can be produced before invasion of the salivary glands. Furthermore, the development of infection to the metacyclic stage may be arrested at any of the preceding morphological stages.

Novinskaya, V. F. (1957). **[Pyraldin in surra of animals.]**—*Veterinariya, Moscow* **34,** No. 4. pp. 54-56. [In Russian.] **3557**

Pyraldin is stated to be an analogue of quinapyramine (antrycide). It is a white crystalline powder, poorly soluble in water and insoluble in alcohol and ether. Preliminary tests on *T. equiperdum* in mice, rabbits and horses have been reported by S. S. Nazarov [*Veterinariya* **31,** No. 11, pp. 52–54 (1954)]. The present author used trypanosomes from camels in Kazakhstan for lab. tests on mice, dogs and horses. In a small number of camels, the drug was given s/c at 0·01 g./kg. body wt. with good therapeutic and prophylactic results.—R.M.

Polge, C. & Soltys, M. A. (1957). **Preservation of trypanosomes in the frozen state.** — *Trans. R. Soc. trop. Med. Hyg.* **51,** 7-8. **3558**

Infected mice are bled when trypanosomes are numerous in the peripheral circulation direct from the carotid artery into 8 ml. of Alsever's solution containing 10% horse serum and the tubes are centrifuged at 500–1000 r.p.m. for 2–3 min. to hasten sedimentation of r.b.c. agglutinated by the horse serum. The clear supernatant fluid containing the trypanosomes is then transferred in the proportion of one part to one part of the Alsever's soln. containing 10% glycerol. After dilution, 0·5 ml. quantities are put into glass tubes, 8 cm. × 1 cm. which are then sealed in a special glass burner and the preparations are ready for freezing. The sealed tubes are placed in a vacuum jar filled with absolute alcohol at room temp. The alcohol is then cooled at about 2° per min. to −30°C. by adding small pieces of solid CO_2, and then at about 5° per min. to −79°C., when additional pieces of solid CO_2 are placed in the jar and it is stored in an insulated chest with blocks of solid CO_2. The authors stated that all the strains of trypanosomes treated in this way had remained motile and pathogenic and that they had maintained all their biological characters after 10 months' storage.—W.A.P.

I. Levine, N. D., McCaul, W. E. & Mizell, M. (1957). **The survival of** *Trichomonas foetus* **upon freezing in the presence of glycerol at different phases of the population growth curve.**—*J. Prot.* **4,** Suppl. p. 5. **3559**

II. Fitzgerald, P. R. & Levine, N. D. (1957). **The effects of storage temperature and other factors on the survival of** *Trichomonas foetus* **at freezing temperatures.**—*Ibid.* p. 5. [Absts. from authors' absts.] **3560**

I. When grown in medium containing glucose instead of maltose as its sugar, *Tr. foetus*, Strain O, was much more sensitive to injury, when frozen to −21°C. in the presence of glycerol, during the initial and log. phases of its population growth curve than at its peak and for some time thereafter.

II. *Tr. foetus* survived better in a chest type refrigerator at a constant temp. of −21°C. than in an upright refrigerator in which the temp. varied cyclically between −23° and −25°C. every 45–60 min. When it was cultivated in CPLM medium buffered with glycylglycine or triethanolamine, it survived better on subsequent freezing in the presence of 1 M glycerol than when it was cultivated in plain CPLM medium. When it was cultivated in CPLM medium buffered with 2 M Sorensen's phosphate buffer, it grew poorly, and very few of the protozoa survived freezing.

Choquette, L. P. E & Desranleau, J. -M. (1957). **On the use of 'M.I.F.' fixative-stain in the diagnosis of trichomoniasis in humans.** —*Canad. J. Microbiol.* **3,** 670-671. **3561**

The authors describe the application of 'M.I.F.' (Merthiolate-iodine-formaldehyde) fixative-stain as a simplified technique for the fixation and staining of trichomonads in human

vaginal swabs. The method is useful where distance from the laboratory precludes the submission of the usual specimens.—A. ROBERTSON.

LUND, E. E. (1957). **The immunizing action of a non-pathogenic strain of *Histomonas* against blackhead in turkeys.**—*J. Prot.* **4,** Suppl. p. 6. [Abst. from author's abst.] **3562**

Administration of a non-pathogenic strain of *Histomonas* by means of infected *Heterakis* eggs did not protect turkeys against pathogenic strains of *H. meleagridis*. Immunization by rectal inoculation afforded some protection against a rectal challenge dose of 10,000 pathogenic histomonads after 3 weeks, and almost complete protection after 6 weeks. Heavier challenge doses were not resisted. *Histomonas* entering with *Heterakis* eggs usually produced typical blackhead.

WHITNEY, L. F. & ARCH, R. (1957). **Experiments with yeast antibiotic on pigeons and rabbits having secondary bacterial septicemia due to infection by coccidia.**—*Vet. Med.* **52,** 247-249. **3563**

In many animals infected with coccidia, blood infection with saprophytic bacteria was noted, accompanied in rabbits by tympanites. Treatment was as follows: 18 pigeons each received 2 i/p inj. of 3 mg. of "malucidin" [an antibiotic yeast extract described by Parfentev (1953)] dissolved in 2 ml. saline, on consecutive days; 19 rabbits were each given 5 mg. of the same preparation by the same route on 2 consecutive days; 10 other rabbits received *per rectum* 10 ml. of a mixture of "malucidin" with crude yeast extract and 10% soap. These treatments appeared to sterilize the blood of the majority of animals and they also had some effect on coccidia. Tympanites in rabbits was quickly reduced. No toxic effects were observed and there was rapid improvement in the animals.
—D. POYNTER.

WALTON, R. B., BENSON, W. L., FROST, B. M., VALIANT, M. E. & WOODRUFF, H. B. (1956). **Compatibility of nicarbazin with antibiotics in high-level antibiotic feeds.** In "Antibiotics Annual 1955/56". pp. 763-767. [New York: Medical Encyclopedia Inc.] **3564**

Nicarbazin and nitrophenide were pharmacologically compatible with penicillin and chlortetracycline when mixed together in poultry feeds.—R.M.

SHMULEVICH, A. I. (1956). **[Large-scale trial of aminoacriquine in bovine theileriosis.]**—*Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 323-326. [In Russian.] **3565**

During three years 12,900 doses (12·9 kg.) of aminoacriquine were used in the treatment of *Th. annulata* and *Th. sergenti* infection of cattle in the Tadzhik, Uzbek, Azerbaijan, Georgian, and Kazakh republics. The average recovery rate varied from 84·4 to 96%, according to region. [See also *V.B.* **27,** 1418.]—R.M.

FOOTE, L. E., LEVY, H. E., TORBERT, B. J. & OGLESBY, W. T. (1957). **Interference between anaplasmosis and eperythrozoonosis in splenectomized cattle.**—*Amer. J. vet. Res.* **18,** 556-559. [Authors' summary modified.] **3566**

Whichever infection is dominant in the carrier animal will establish itself first when blood is inoculated into susceptible, splenectomized calves. When acute eperythrozoonosis is established first and the calf survives, the anaplasmosis infection may be suppressed indefinitely, unless a second or third inoculation of anaplasmosis-infective blood is given. When a mild form of eperythrozoonosis is established first, it is subsequently replaced by acute or peracute anaplasmosis. When anaplasmosis is the initial infection and even though it is acute, it is replaced by eperythrozoonosis.

WEINMAN, D. & CHANDLER, A. H. (1956). **Toxoplasmosis in man and swine—an investigation of the possible relationship.**—*J. Amer. med. Ass.* **161,** 229-232. **3567**

Serum from 42 of 88 slaughtered pigs was positive at a titre of 1:64 or more to the dye test for toxoplasmosis. The pigs came from a district where husbandry was poor, and where there was possibility of contact with rats. Toxoplasmosis antibodies were commonest in human beings in communities which consumed undercooked pork. It was considered that the transmission of toxoplasmosis from rat to pig to man occurred under similar conditions to those in which trichinosis was transmitted.—R.M.

I. BEVERLEY, J. K. A. & FRY, B. A. (1957). **The treatment of experimental toxoplasmosis in rabbits.**—*Brit. J. Pharmacol.* **12,** 185-188. [Authors' summary copied *verbatim*.] **3568**

II. BEVERLEY, J. K. A. & FRY, B. A. (1957). **Sulphadimidine, pyrimethamine and dapsone in the treatment of toxoplasmosis in mice.**—*Ibid.* 189-193. [Authors' summary modified.] **3569**

I. Sulphadimidine alone is of little value in treating experimental toxoplasmosis in rabbits, because most rabbits acetylate the drug very rapidly and within a short time of dosing there is little or none of the uncombined drug in the blood. In rabbits which do not acetylate sulphadimidine rapidly, relatively high concentra-

tions of the free sulphonamide can be attained in the blood and toxoplasmosis responds to treatment. Sulphathiazole is not acetylated so rapidly and is effective even in rabbits which acetylate sulphadimidine quickly. Pyrimethamine, even in doses as high as 50 mg. three times daily, is ineffective; dapsone is effective.

II. In similar experiments using mice, sulphadimidine, dapsone, and pyrimethamine were tested alone and in various combinations. In the treatment of active infection, sulphadimidine by itself was effective, but relapses were common. Pyrimethamine gave complete cures and prevented the carrier state when used in doses near to the toxic level. Dapsone alone was not as good as either of the other two drugs. The best combination was sulphadimidine plus pyrimethamine; the two drugs were synergic. In doses well below the toxic level, this combination not only controlled the acute infection but prevented relapses and the development of the carrier state. Dapsone and pyrimethamine were also synergic, but were less effective. No synergy was found between dapsone and sulphadimidine. The mechanism of relapse and the development of the carrier state and the modes of action of the drugs alone and in combination are discussed.

LUBINSKY, G. (1957). *Buxtonella sulcata* **(Ciliata : Holotricha), a parasite of** *Bos indicus* **and** *Bubalus bubalus* **in the Western Punjab.**—*Canad. J. Zool.* **35,** 545-548. **3570**

Buxtonella sulcata occurred in the caecum in 73% of 100 zebu cattle and 38% of 16 buffaloes, but was not found in 20 sheep or 20 goats. Young exconjugants of *B. sulcata* can be easily mistaken for *Balantidium*. L. believes that *Balantidium coli* var. *bovis* described by Cooper and Gulati from zebu cattle in Assam, and the *"Balantidium"* described by Priestley from buffaloes in Bengal are really *Buxtonella sulcata*. As regarded by Dogiel, *B. sulcata* may be a synonym of *Infundibulorium cameli*.

—G. K. SWEATMAN.

FALLIS, A. M. & WOOD, D. M. (1957). **Biting midges (Diptera : Ceratopogonidae) as intermediate hosts for Haemoproteus of ducks.**—*Canad. J. Zool.* **35,** 425-435. **3571**

Hippoboscid flies were shown by other workers to be intermediate hosts of some species of *Haemoproteus*, but biting midges are suitable intermediate hosts for *H. nettionis*. This was shown experimentally, but has not yet been confirmed by observation on midges infected naturally. In Algonquin Park, Ontario, *H. nettionis* was transmitted nocturnally in late June and in July. The prepatent period in ducks may be 2 to 3 weeks. The gametocytes mature in 4 to 6 days.—G. K. SWEATMAN.

DISSANAIKE, A. S. (1957). **On protozoa hyperparasitic in helminths, with some observations on** *Nosema helminthorum* **Moniez, 1887.** — *J. Helminth.* **31,** 47-64. [Abst. from author's summary.] **3572**

The protozoa reported from helminths parasitic in animals are summarized in three tables, with a few comments on some of the more interesting forms.

Nosema helminthorum was found hyperparasitic in *Moniezia expansa* and *M. benedeni* of sheep in England, and *Monieza* sp. from a buffalo calf in Pakistan. The macroscopic and microscopic changes in parasitized tapeworms were described; it was believed that the microsporidian was not pathogenic.

See also absts. **3784** (report, Northern Rhodesia); **3785-3786** reports, Southern Rhodesia); **3789** (report, Somaliland).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

PYL, G. (1956). Dispersität und Sedimentationskonstante des neurotrop modifizierten Standard-A-Maul-und-Klauenseuche-Virus der weissen Maus. **[Dispersion and sedimentation constant of the neurotropic variant of standard Type A foot and mouth disease virus from mice.**—*Arch. exp. VetMed.* **10,** 358-364. **3573**

The neurotropic virus was of uniform particle size. A simple capillary cell, suitable for biologically determining sedimentation rate, was described. By using it, the sedimentation constant of the neurotropic virus was estimated as 140 Svedberg units. Thus after many thousands of passages in mouse brain, the virus had lost its original dermotropic properties, but had not altered in size.—R.M.

MANSVELT, P. R. (1956). **Rabies in the Northern Transvaal (1950 outbreak).**—*J. S. Afr. vet. med. Ass.* **27,** 167-178. **3574**

In June 1950, rabies suddenly appeared in the Northern Transvaal, a hitherto unsuspected area, and in the ensuing years, a wave of infection has passed along the water courses. General control measures including destruction of stray dogs, local quarantine measures and, since June 1952, vaccination with Flury virus of all dogs

over 5 months old have not been wholly effective until measures were taken to control the wild animal carriers, which were almost entirely jackals. The most effective way of destroying these has been with strychnine poisoned raw meat baits, trapping at burrows or with bait being ineffective. Two small centres of infection still exist.—A. ACKROYD.

BELL, J. F., BURGDORFER, W. & MOORE, G. J. (1957). **The behavior of rabies virus in ticks.**—*J. infect. Dis.* **100,** 278-283. [Authors' summary modified.] **3575**

Viraemia could not be detected in domestic rabbits infected with fixed rabies virus: ixodid ticks, *Dermacentor andersoni* and *Rhipicephalus sanguineus,* engorged upon such rabbits, did not become infected. When *D. andersoni,* and argasid ticks *Ornithodoros moubata,* and *O. turicata* were infected with rabies virus by means of the glass capillary tube and membrane feeding techniques, the virus survived in ixodid ticks generally for only 3 days, in nymphal argasid ticks for about 14 days, and in adult argasid ticks for 20 days. No evidence of multiplication of the virus could be obtained either in ticks fed infective materials or in ticks inoculated with virus suspensions. Ticks which partially engorged upon virus suspensions and completed engorgement upon mice and g. pigs did not transmit the virus mechanically.

MORITSCH, H. (1956). Experimentelle Untersuchungen über die Vermehrung des Vaccina- und des Kuhpockenvirus in der Maus. **[Multiplication of vaccinia and cow pox viruses in mice.]**—*Zbl. Bakt. I.* (*Orig.*). **166,** 427-453. [English, French and Russian summaries.] **3576**

Both vaccinia virus and cow pox virus multiplied in the brains of mice after intracerebral infection, and the mice died in convulsions. In the mice with cow pox infection inclusion bodies were observed in the cytoplasm of the cells of the choroid plexus and ependyma, but not in the mice infected with vaccinia virus. After intraperitoneal infection both viruses multiplied in the peripheral organs. All the mice infected with cow pox virus died from systemic infection, compared with 60% of those with vaccinia virus infection. A small quantity of cow pox virus was demonstrated in the brain, the result of haematogenic dissemination, but there was no evidence of multiplication or of pathological changes, even after increase of the infective dose, injury of the brain, or administration of cortisone.—M.G.G.

DRAGANOV, K. I. (1956). **[Electron microscopy in the study of the biology of viruses.]**—*Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 5-30. [In Russian.] **3577**

A review of the literature on pox viruses, and a preliminary account of the morphology of pigeon pox virus (with 4 photomicrographs). —R.M.

DOUGHERTY, R. M. & GROUPÉ, V. (1957). **Studies on nonspecific acquired resistance to viral toxicity in mice.**—*Proc. Soc. exp. Biol., N.Y.* **95,** 593-596. [Authors' summary modified.] **3578**

Previous intravenous injection of *Escherichia coli* endotoxin protected mice against subsequent inoculation of toxic quantities of influenza virus, while previous injection of influenza virus failed to protect mice against challenge with endotoxin administered by the same route. Previous intracerebral injection of minute quantities of endotoxin, as well as sublethal quantities of influenza virus, exerted a protective effect in mice challenged 24 hours later with toxic quantities of influenza virus by the same route. Endotoxin failed to protect mice against infection with the neurotropic strain of influenza virus or against the neuropathic effect of dilute Newcastle disease virus. It is suggested that the mechanisms of viral interference and acquired resistance to viral toxicity are different.

VON SPROCKHOFF, H. (1956). Über den Nachweis von komplementbindendem Antigen in Gehirnen bornakranker Pferde. **[Complement fixing antigen in the brains of horses with Borna disease.]**—*Mh. Tierheilk.* **8,** 281-290. **3579**

Brain extracts from 17 horses with Borna disease were tested for complement-fixing antigen; 14 were positive, one doubtful, and 2 negative. Extracts from the brains of 4 healthy horses, 2 foxes and a deer with rabies, and 6 horses histologically negative for Borna disease were negative. This test is recommended for confirming the histological diagnosis of Borna disease. A negative reaction, however, does not mean the absence of the disease. It is important to use material from various parts of the brain, in particular the cerebral cortex of the frontal lobes, the nucleus caudatus, the hippocampus and the medulla oblongata. The material should be frozen and thawed several times, homogenized, and centrifuged at 3000 r.p.m. for 1½ hours. Contaminated material is suitable but should be centrifuged at higher r.p.m.—M.G.G.

CERETTO, F. (1956). Su di una forma di encefalo-mielite emorragica dei giovani bovini. **[An outbreak of haemorrhagic encephalomyelitis in calves.]**—*Ann. Fac. Med. vet. Torino* **6,** 133-145. [English, French and German summaries.] **3580**

Calves aged 2–10 weeks kept in byres several hundred metres apart were affected practically simultantously. The disease was characterized by nervous symptoms—intense excitability, incoordination of movement, prostration and death in 3–5 hours. All of 11 animals affected died. The main P.M. findings were petechiae in the serous membranes, heart, skeletal muscles, brain, slight parenchymatous degeneration and marked hyperaemia of the brain. Microscopically a histiocytic reaction was observed. In the large nerve cells there were severe degenerative changes (tigrolysis, chromatolysis, vacuolation, etc.) and, in a high percentage, intranuclear inclusion bodies. Bacteriological examination was not carried out and the infection is considered similar to Borna disease in its epidemiological, clinical and histopathological manifestations.—T.E.G.R.

THIÉRY, G. (1956). Essai de pathogénie de la peste bovine à la lumière de la conception moderne du syndrome d'adaptation. **[Pathogenesis of rinderpest in relation to stress.]**—*Rev. Élev.* **9,** 237-245. [English and Spanish summaries.] **3581**

The view is expressed that lesions of the digestive tract, associated with rinderpest in cattle and rabbits, are not specific but are common to other conditions and are observed during the first stages of the adaptation syndrome. The pathogenesis of the lesions in relation to stress, the mode of action and the requirements of the virus are discussed. Neutrophiles are considered to play an important role in the transport of virus throughout the body; desoxyribonucleic and ribonucleic acids, and, to some extent proteolytic enzymes have a specific function in its multiplication. It is hoped that it will be possible to grow the virus in cattle injected i/p with a sterile suspension of nucleic acids; the ensuing peritonitis would attract the neutrophiles charged with virus and thus provide a suitable culture medium. Cell inclusions are considered part of the defence mechanism and death is attributed partly to inability of the patient rapidly to synthesize the vital proteins and partly to electrolytic imbalance of the body fluids. The histology and physiology of lymphoid tissue and adrenal glands are discussed. [See also *V.B.*, **26,** 3784, 3785.]—T.E.G.R.

MACPHERSON, L. W. (1957). **Bovine virus enteritis (winter dysentery).** — *Canad. J. comp. Med.* **21,** 184-192. [French summary.] **3582**

Twenty outbreaks of winter dysentery in the Ottawa Valley were studied. Most of the outbreaks occurred in autumn or winter and were coincident with sudden drops in atmospheric temperature. Animals under 9 months of age were resistant as were old animals, while most severe symptoms were found in the one to three year age group. All susceptible animals in a herd showed symptoms simultaneously, and whole areas became affected at once. Symptoms included naso-lachrymal discharge and diarrhoea with initial temperatures of 103° to 104°F. There was a severe drop in milk yield. The course was from 3 to 14 days depending on the age of the animal. Lesions included catarrhal inflammation of the jejunum and ileum with marked ecchymoses and petachiae and enlargement of the Peyer's patches. Peritonitis was observed and mild tracheitis and pneumonic foci were seen. Transmission experiments with filtrates of faecal material yielded results pointing to a virus aetiology. Secondary bacterial infection resulted in symptoms and lesions resembling those of mucosal disease.—A. GREIG.

CARLSON, R. G., PRITCHARD, W. R. & DOYLE, L. P. (1957). **The pathology of virus diarrhea of cattle in Indiana.**—*Amer. J. vet. Res.* **18,** 560-568. [Authors' summary modified.] **3583**

The pathology was ascertained by clinical and P.M. examination of field and experimental cases. There was considerable variation in the degree of the lesions, but they were, in general, more severe in the field than in the experimental cases. The mucosae of the alimentary tract, from the muzzle to the anus, and the lymphoid tissue were the most constant sites for lesions. Lesions of the digestive tract were primarily of an erosive and ulcerative nature and were associated with oedema, congestion, and haemorrhage, particularly in those areas where only a single layer of cells separates the lumen of the tract from the underlying vascular stroma. Oedema and exhaustion of the germinal centres were the principal changes in lymphatic tissue. Most of the changes in other tissues were considered secondary and non-specific.

MORTELMANS, J. (1956). Wratten-behandeling bij runddieren met anthiomaline. **[Treatment of bovine papillomatosis with lithium antimony thiomalate ("Anthiomaline").]** — *Vlaam. diergeneesk. Tijdschr.* **25,** 244-248.

[In Flemish. English, French and German summaries.] **3584**

Success was claimed for the treatment of extensive warts in 8 young cattle in the Belgian Congo by the i/m inj. of 6 doses of lithium antimony thiomalate, at intervals of 2 days, at a dosage of 0·5–0·7 g./100 kg. body wt.—R.M.

SAITO, Y., SHIMADA, F., MASU, S., TODA, M. & IMANISHI, N. (1954). **Studies on the non-bacterial and infectious pneumonia of goats. I. Isolation and morphological findings of the causative agent.**—*Kitasato Arch.* **27,** 103-113. [In English.] **3585**

An infectious pneumonia caused heavy mortality among goats imported from the U.S.A. in 1947, and it was subsequently observed in Japanese goats. A virus was isolated which passed through Berkefeld V and N filters and caused pneumonia when inoculated into the nose or trachea of goats, cattle, rabbits, dogs, fowls and lab. animals; it appeared to belong to the psittacosis-lymphogranuloma group.—R.M.

KORN, G. (1956). Histologische Untersuchungen über initiale Lungenveränderungen bei Schweinepest nach experimenteller Infektion. **[Histology of the initial lung lesion in experimental swine fever.]**—*Arch. exp. VetMed.* **10,** 471-485. **3586**

Histological changes in the lungs during the first 12 days after s/c infection with swine fever virus were the result of circulatory disturbance, and were essentially similar to the primary lesions seen in other organs. The picture differed from that of viral pneumonitis. Congestion and oedema which formed as a result of the primary lesions probably provided a favourable environment for secondary invaders.—R.M.

POTEL, K. & KORN, G. (1956). Experimentelle Untersuchungen zum Nachweis des Schweinepestvirus und seiner Wegspuren im Zentralnervensystem. **[Presence of swine fever virus in the central nervous system, in relation to histological lesions.]**—*Arch. exp. VetMed.* **10,** 370-377. **3587**

The relatively high virus titre in the brain of pigs killed 3–7 days after artificial infection was due to the presence of virus in the brain tissue, and not solely to increased vascularity. This was determined by washing out with saline the brain of 5 anaesthetized pigs, infected 1, 3, 5, 7 or 9 days previously. Virus was distributed fairly evenly in different parts of the brain and spinal cord, thus differing from the uneven distribution of Teschen disease virus in the brain. It was believed that virus accumulated in the brain as the result of increased permeability of the walls of blood vessels, and not as the result of a special affinity of the virus for nervous tissue. [See also *V.B.* **27,** 1760.] —R.M.

GUSTAFSON, D. P. & POMERAT, C. M. (1957). **Cytopathogenic effects of hog cholera virus on embryonic swine tissues *in vitro*.**—*Amer. J. vet. Res.* **18,** 473-480. [Authors' summary modified.] **3588**

Lymph node cultures exposed to swine fever virus before being embedded in plasma clots developed cytoplasmic changes in cells of the outgrowth. The mitochondria of the juxtanuclear zone became spheroidal with clear, light haloes; cytoplasmic volume was reduced with attendant bubbling of the cellular membranes and filamentous strands clinging to the glass at previous sites of attachment; and the cytoplasm became much more granular. Lymphocytes died after exposure to virulent virus. Choroid plexus cultures were seriously retarded in outgrowth and showed inconsistent microscopic changes. Cerebellum, kidney, testes, duodenum, spleen, heart, liver, and lung tissue cultures were not measurably affected by the virus.

DUNNE, H. W., LUEDKE, A. J., REICH, C. V. & HOKANSON, J. F. (1957). **The *in vitro* growth of hog cholera virus in cells of peripheral blood.**—*Amer. J. vet. Res.* **18,** 502-507. [Authors' summary modified.] **3589**

Swine fever virus was propagated in cells from peripheral blood. Leucocytes but not erythrocytes appeared capable of supporting virus growth. The "Michigan A" strain [see *V.B.* **23,** 3353] was modified by passage *in vitro,* but it was antigenetically impotent. The "Sprankle" strain was more adaptable to culture and showed less antigenic variation. A method of demonstrating subprotective immunity was described.

LIKHACHEV, N. V. (1956). **[Methods of obtaining swine fever immune serum.]**—*Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 44-45. [In Russian.] **3590**

L. hyperimmunized pigs against swine fever by the intraperitoneal inj. of either a single dose of 600 ml. infective haemolysed blood, or three doses of 25, 50 and 100 ml. or 50, 100 and 150 ml. Pigs were protected from the simultaneous inoculation of 1 ml. virus suspension by a minimum dosage of 0·6 ml./kg. body wt. of the hyperimune serum obtained by these methods. —R.M.

Cole, C. G., Torrey, J. P. & Zinober, M. R. (1957). **Twelve years' successful vaccination of farm herds with crystal violet-glycerol hog cholera vaccine.**—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago,* 1956 pp. 263-269. [Authors' summary modified.] **3591**

In 12 years more than 12,000 pigs on 42 widely scattered farms were vaccinated with crystal violet-glycerol vaccine. Swine fever did not appear on any of the farms during this period. Of 523 pigs challenged with virulent swine fever virus at marketing age, 482 (93%) survived. Slight or no reaction was observed in 77·5%.

Slanina, L'., Popluhár, L. & Vrzgula, L. (1956). Príspevok k štúdiu patogenézy, klinického a laboratórneho vyšetrovania a niektorých biologických vlastností vírusu nákazlivej obrny ošípaných. [**Pathogenesis, clinical and laboratory examination, and characteristics of the virus of Teschen disease.**]—*Folia vet., Košice* **1,** 335-343. [In Slovak. German and Russian summaries.] **3592**

Piglets become susceptible at 2 weeks of age. In large piggeries 47% of all cases were in pigs weighing 50 kg. and over, in small piggeries highest incidence was in those between 20–50 kg. Meningitis was rare. In piglets and store pigs the disease generally took an acute or peracute course, in brood sows there was a prodromal stage lasting 3–6 days. Haemoglobin, r.b.c. count and blood calcium levels were within normal limits, but the leucocyte count and the number of lymphocytes in the cerebrospinal fluid were increased.—E.G.

Buck, G. & Serres, H. (1957). Étude de la virulence des centres nerveux de porcelets inoculés de virus de Teschen (souche malgache). [**Virulence of the nervous system in piglets inoculated with Teschen disease virus (Madagascar strain).**] — *Ann. Inst. Pasteur* **93,** 230-236. [English summary modified.] **3593**

Titrations of Teschen disease virus were carried out on the c.n.s. of young pigs inoculated with a Madagascar strain and killed at various stages of the disease. At the beginning of the disease the c.n.s. does not contain much virus, the maximum being found when paralysis is fully established and the animal is still hyperthermic. The LD_{50} is then $10^{6\cdot6}$ per g. of infected nervous substance. This titre decreases only slightly during the terminal phase. With the Madagascar strains, autosterilization rarely occurs. Vaccines prepared from infected c.n.s. taken at the beginning of the disease have proved less effective than those from brains taken at a later stage (even during the hypothermic pre-agonic stage).

Sokol, A. & Vasil, M. (1956). Experimentálne štúdium prirodzeného prenosu chrípkoých hemaglutinačne—inhibičných protilátok a ich dynamiky v sére ciciakov. [**Experimental study of maternal transfer of swine influenza haemagglutination-inhibiting antibodies, and their behaviour in piglets.**] — *Folia Vet., Košice* **1,** 81-87. [In Slovak. German and Russian summaries.] **3594**

Maternal transfer of haemagglutination-inhibiting antibodies was demonstrated in a sow, injected with Shope's influenza virus three times during late pregnancy. In the new-born piglets antibodies were not demonstrable before ingestion of colostrum; when they were allowed to suck for 5 days, however, their antibody titres equalled those of their dam. During the ensuing period decrease in the antibody titre was more rapid in the piglets than in the dam.—E.G.

Rosocha, J. & Neubert, J. (1956). Izolácia vírusu chrípky ošipaných z potkanov a štúdium jeho základných vlastností. [**Isolation of swine influenza virus from rats and a study of its characteristics.**]—*Folia vet., Košice* **1,** 179-189. [In Slovak. German and Russian summaries.] **3595**

Swine influenza virus, isolated from rats, trapped in an infected piggery, was highly virulent for laboratory mice up to the third chick-embryo passage, but after the eighth passage its pathogenicity decreased. Mouse passage, however, increased its virulence. Weaned piglets infected intranasally or intratracheally with 5 ml. of allantoic fluid had increases in body temp., not exceeding 0·7°C.

The virus isolated was identified by cross haemagglutination-inhibition tests and by virus neutralization in chick embryos.—E.G.

Szczygielska, J., Lorkiewicz, Z. & Parnas, J. (1956). Vergleichende Untersuchungen über das pneumotrope Virus bei Mensch und Schwein. [**Comparative studies on pneumotropic viruses in human beings and pigs.**]—*Arch. exp. VetMed.* **10,** 487-516. **3596**

A detailed account in German of work previously reported concerning strain G_1, a pneumotropic virus isolated in Poland from a piglet with pneumonia. It was immunologically similar to a virus isolated by Harnach from pigs in Czechoslovakia. There are 9 electron photomicrographs of the virus. [See also *V.B.* **25,** 1981 & **26,** 838.]—R.M.

BROWN, L. V. (1957). **Pathogenicity for rabbit kidney cell cultures of certain agents derived from "normal" monkey kidney tissue.**—*Amer. J. Hyg.* **65**, 189-209. **3597**

This is a study of cell degeneration occurring spontaneously in tissue cultures of kidneys of apparently normal healthy rhesus (*Macaca mulatta*) or cynomolgus (*Macaca irus minandensis*) monkeys and characterized by the formation of "blisters" or "foamy" patches and of multinucleated giant cells. Isolation and propagation of the causal agent were carried out. In each type of culture—monkey, human or rabbit kidney, monkey testis or chick embryo—the characteristic feature was the formation of multinucleated giant cells and the term "giant-cell virus" is, therefore applied to the causal agent. Ten strains of this virus, each derived from a different lot of monkey kidney suspension, were isolated by first passage in cultures of trypsinized rabbit kidney tissue.

—T.E.G.R.

LANFRANCHI, F. & DE JACO, M. (1956). Reperti di infezioni da virus di Green nell'uomo. **[Suspected canine virus hepatitis in human beings.]**—*Agg. Mal. Infez.*, **2**, 79-94. **3598**

A detailed clinical account of a febrile illness, accompanied by nervous symptoms, in two human beings. In each case the serum was positive to c.f. tests for canine virus hepatitis and negative for various other diseases. Blood from one case was inoculated into a dog, which was killed 30 days later: it had an enlarged liver and spleen, but c.f. tests for canine virus hepatitis were negative.—R.M.

RUBIN, H., FRANKLIN, R. M. & BALUDA, M. (1957). **Infection and growth of Newcastle disease virus (NDV) in cultures of chick embryo lung epithelium.**—*Virology* **3**, 587-600. [Abst. from authors' summary.] **3599**

It was found that extra-cellular virus and cell-associated virus were equal in amount during the period of exponential virus increase, and the apparent release time (*i.e.*, the time required for release of a newly formed virus particle into the medium after it has gained the property of infectivity) was calculated as about 80 min. Further study showed that practically all of this time was spent at the cell surface. In fact, there was no compelling evidence for infective virus at any place other than the cell surface. X-ray inactivation studies showed that both cell-associated virus and released virus occur as independent particles rather than in clumps.

SCHNEIDER, B. (1956). Zur Wirkungsweise der Ein- und Zweimalimpfung mit Geflügelpest-Adsorbatvaccine. **[Mode of action of single and dual vaccination with Newcastle disease adsorbate vaccine.**—*Vet.-med. Nachr.* No. 4. pp. 221-229. **3600**

Twelve fowls received a single i/m injection of 0·0625–2 ml. of Newcastle disease adsorbate vaccine. Two weeks later haemagglutination-inhibition titres of 1:4 to 1:128 were found. All except 3 were immune to challenge infection. A second group of 12 fowls each received i/m 2 ml. of vaccine. The average titre of the 12 birds reached a peak of 1:64 after 2 weeks and then gradually declined to 1:4 after 7 weeks. Seven groups of fowls received 2 injections each of 1 ml., with an interval ranging from 5 days to 5 weeks between injections. The highest titres were attained by the fowls which received their second injection after 3 weeks, the average titres being 1:137 two weeks after the second injection, and 1:47·5 four weeks afterwards. Two vaccinations of 1 ml. with an interval of 3–4 weeks are therefore recommended.—M.G.G.

OLSON, N. O., SHELTON, D. C., BLETNER, J. K., MUNRO, D. A. & ANDERSON, G. C. (1956). **Studies of infectious synovitis in chickens.**—*Amer. J. vet. Res.* **17**, 747-754. **3601**

The morbidity, mortality, clinical symptoms and P.M. findings are described. Culture of the causal organism was successful only on 5-day-old chick embryos, 37 passages being made without a marked increase in pathogenicity. Growth was inhibited by streptomycin but not by penicillin. Direct transmission by oral administration of tissue suspension from infected birds was not achieved, but synovitis developed in birds inoculated into the foot pad with material from 1st or 2nd chick embryo passage. Broth suspension of joint exudate was inoculated into other birds by various routes and the proportion of birds infected to birds inoculated was: nasal instillation, 0/3; conjunctival instillation, 1/4; tracheal instillation, 0/1; foot pad inoculation, 2/2; hock joint inoculation 6/6; conjunctival and nasal instillation, 1/1. Results with 1st and 2nd chick embryo passages were: foot pad, 6/6; hock joint 4/4; air sac, 1/1. Contact controls were unaffected during 25–44 days. Chick embryo cultures up to the 28th passage were all pathogenic. Results with 3rd passage were: foot pad, 16/16; i/v inoc., 5/15; sinus, 5/15; conjunctiva, 0/4; contact controls, 3/22. Results of 2nd and 28th

passages are given in tabular form, those of other passages were: 1st, 1/2; 5th, 3/8; 10th, 5/5; 14th, 2/5; 18th, 4/4; and 21st, 2/7.
—T.E.G.R.

SPERLING, F. G. (1957). **Isolation of psittacosis (ornithosis) virus from a group of birds including a captive starling.** — *Vet. Ext. Quart. Univ. Pa* No. 147, pp. 156-157. **3602**

After psittacosis had been diagnosed in a human being, all 52 birds in an aviary were killed and examined. There had been no evidence of clinical disease in the birds, and apart from occasional splenomegaly, no lesions were found. The virus was isolated from 12 birds, including 8 parakeets and a starling. It was stated to be the first time that the virus had been isolated from a starling.—R.M.

MUSSGAY, M. (1957). Ein Beitrag zur Virusreinigung mit Bentonit. **[Purification of viruses with bentonite.]** — *Zbl. Bakt. I. (Orig.)* **169,** 12-19. [English, French and Russian summaries. English summary modified.] **3603**

A partial purification of the viruses of F. & M. disease, eastern equine encephalitis, and fowl pox was obtained by the action of bentonite on infective tissue homogenates. Two thirds of the proteins from homogenates of FMD-infected unweaned mice were removed without decreasing the infectivity titre. Treatment of EEE-chick-embryo homogenates with a bentonite-concentration which absorbed about half of the proteins resulted in a slight decrease in infectivity titre; however, a vaccine made from such a homogenate had a decreased immunizing power. Homogenates of fowl pox-infected chorioallantoic membranes lost a great part of their infective activity after they had been purified with bentonite. Bentonite-purification may be used in the preparation of antigens for the c.f. test in order to clear them from anticomplementary substances. FMD-antigens obtained by alcohol-ether extraction are, however, superior to bentonite-purified antigens.

I. HAUSSMANN, H. G. & GRAFE, A. (1956). Desinfektion des Influenza-, Mumps- und Newcastle-Virus im eiweissfreien Medium. **[Disinfection of the viruses of influenza, mumps and Newcastle disease in a protein-free medium.]**—*Z. Hyg. InfektKr.* **143,** 278-303. **3604**

II. GRAFE, A. & HAUSSMANN, H. G. (1956). Desinfektion des Influenza-, Mumps- und Newcastle-Virus im adsorbierenden Medium. **[Disinfection of the viruses of influenza, mumps and Newcastle disease in an adsorptive medium.]**—*Ibid.* 304-318. **3605**

I. The authors tested the viricidal properties of four products of undisclosed composition, spoken of as "Havisol" [A]—a hands disinfectant, "Ivisol" [B]—a disinfectant for instruments, "Gevisol" [C]—a general disinfectant and "Parmetol" [D]—a stool disinfectant.

The haemagglutination titre of the allantoic fluid of chick embryos infected with either human influenza or Newcastle disease was not affected after exposure for 100 hours to a concentration of 0·013% of either A, B or C, or of 0·34% of D. Maximum concentrations of these products to be used in inocula for injection into the allantoic sac of the chick embryo for inactivation of the viruses of human influenza or Newcastle disease were:— 0·8% of A, B or C and 10% of D; and for mumps virus, 0·4% of A, B or C and 10% of D. A conc. of 0·5% of A, B or C or of 1% of D was sufficient for the inactivation of influenza or Newcastle disease viruses; and of 0·4% of A, B or C or of 1% of D for mumps virus. The lowest concentrations that inactivated the viruses were 0·005% of A, B or C after an exposure of 2 min. and 0·05% of D after 10 min. At a conc. of 0·005% product A inactivated influenza virus in an albumin-free lung suspension, but not in a suspension containing albumin.

II. In tests with disinfectant B [see I above] at 2% on the influenza virus and A at 0·5% on Newcastle disease virus and C at 1% on mumps virus, the results being assessed after 6 min., viricidal action was weakened in the presence of albumin, and in proportion to its concentration. The authors concluded that the products were conveniently viricidal in the presence of up to 0·5% of albumin. B at 2% inactivated influenza virus in the presence of 0·1% albumin in 2 min., in 0·5% in 3 min., in 1% in 3 min., and in 2% or 4% in 4 min. A at 0·5% inactivated N.D.V. in the presence of 0·1% albumin in 2 min., and in 0·5% or 1% in 4 min. C. at 1% inactivated mumps virus in the presence of 0·1% albumin in 1 min., in 0·5% in 2 min., in 2% in 5 min., and in 4% in 6 min.—W.A.P.

KITZE, L. K., HIEMSTRA, H. C. & MOORE, M. S. (1957). **Q fever in Wisconsin. Serological evidence of infection in cattle and in human beings and recovery of *C. burneti* from cattle.**—*Amer. J. Hyg.* **65,** 239-247. [Authors' summary modified.] **3606**

The sera of 22,304 cattle selected at random from 2,130 herds were examined in the complement-fixation test for Q fever antibodies. A

large number of serologically positive animals, many with high antibody titres, were found in 9 counties. In this area the average positive percentage was 8·0 (as compared to only 0·35 in the other 62 counties); individually, the 9 counties had percentages ranging from 22·3 to 1·2. *Rickettsia burneti* was recovered from the milk of 7 animals in this area. The behaviour of these strains in lab. animals is described.

A small group of families operating dairy farms where evidence of Q fever infection was found in the cattle had the highest percentage (23·3) of individuals with serum antibodies to Q fever antigen. Next came the employees of a meat packing plant (4·5% positive). Among employees of another such plant and a group of individuals admitted to general hospitals only 0·4% were positive.

See also absts. **3503** (phage-typing of salmonella); **3779** (preservation of influenza virus); **3783** (report, Lister Institute); **3784** (report, Northern Rhodesia); **3785-3786** (reports, Southern Rhodesia); **3787** (report, Basutoland); **3789** (report, Somaliland).

IMMUNITY

I. Bangham, D. R. & Terry, R. J. (1957). **The absorption of ^{131}I-labelled homologous and heterologous serum proteins fed orally to young rats.**—*Biochem. J.* **66**, 579-583. [Abst. from authors' discussion.] **3607**

II. Bangham, D. R. & Terry, R. J. (1957). **The survival of globulins absorbed from the gut in suckling rats.** — *Ibid.* 584-587. [Authors' summary modified.] **3608**

I. The authors' finding that ^{131}I-labelled globulin was absorbed unchanged from the gut of unweaned rats up to the age of 21 days (an age when they are normally weaned) was in agreement with the result obtained previously by immunological means (Halliday, 1955). The use of isotopically labelled proteins has made this study quantitative. An average of 7·5% of the homologous globulins fed to the 7- and 14-day-old rats was absorbed within 3 hours.

II. The catabolism of homologous and heterologous whole adult ^{131}I-labelled serum proteins which have been absorbed from the gut or injected intraperitoneally in rats 7, 14, and 21 days old was studied by measuring the total body radioactivity with a ring counter. The survival time of the homologous protein absorbed (60–90% γ-globulin) in 7- and 14-day-old rats was approx. the same as that of γ-globulin injected into adult rats. The survival time of heterologous (monkey) serum protein absorbed in 7- and 14-day-old rats was at least as long as or longer than that of homologous serum protein absorbed. It is inferred from these results that some of the γ-globulin was not denatured during its absorption from the gut into the blood stream.

Hanset, R. (1956). L'hérédité des facteurs antigéniques cellulaires chez les bovins. **[The inheritance of blood group factors in cattle.]** —*Ann. Méd. vét.* **100**, 309-324. **3609**

A discussion of the literature.—R.M.

Goodwin, R. F. W. (1957). **The clinical diagnosis of haemolytic disease in the new-born pig.**—*Vet. Rec.* **69**, 505-507. **3610**

G. discusses the differential diagnosis of haemolytic disease. Three main diagnostic signs are described: colour changes, (either yellow or red wine), in the skin and carcass; haemoglobinuria, particularly in acute cases; and spontaneous auto-agglutination in shed blood from affected piglets. A field diagnostic test is described which is based on auto-agglutination of the red cells.—Alan E. Pierce.

Goodwin, R. F. W. & Saison, R. (1957). **The blood groups of the pig. V. Further observations of the epidemiology of haemolytic disease in the new-born.**—*J. comp. Path.* **67**, 126-144. **3611**

The authors studied the incidence of neonatal haemolytic disease of piglets in herds immunized against swine fever with crystal violet vaccine. When studying dams producing litters affected with haemolytic disease there is a selection for animals which have a persistent iso-antibody titre. Experimentally vaccinated pigs therefore did not show the same persistence of titre. Haemolytic disease characterized by slight jaundice and sensitized red cells, could be anticipated by a knowledge of the maternal titre, although severe cases could not be forecast. However, the disease was not usually fatal when the serum titre of the sow was lower than 512 measured by the indirect anti-globulin sensitization test. More than two vaccinations with crystal violet vaccine did not appear to increase the risk proportionately, as by the second vaccination a representative titre for the animal was attained. The severity of the disease was not directly related to the degree of sensitization of the cells, so that although sensitization could be minimized by restricting suckling during the first 24 hours, the severity of the ensuing disease was not greatly modified.—Alan E. Pierce.

Podliachouk, L. & Eyquem, A. (1956). Les antigènes érythrocytaires et plasmatiques des porcs. **[Erythrocyte and plasma antigens in**

pigs.] —*Ann. Inst. Pasteur* **91**, 751-758. [English summary modified.] **3612**

Iso-agglutinins and haemolysins were studied in serum from 345 pigs. Two antigens were found in 160 of the pigs: antigen A was demonstrated in 50% of them, and another antigen (antigen X) in 80%. These antigens were controlled by two genes which segregated independently. Serum from 70% of A-positive pigs contained soluble A-antigen. There was an antigenic relationship between this substance and bovine J-antigen, ovine R-antigen and human A-antigen.

DAVIDSOHN, I., HERMONI, D. & HANAWALT, E. G. (1957). **Experimental hemolytic anemia in rabbits. Protective role of sensitization to the species-specific protein of the heteroimmune hemolytic serum.**—*Blood* **12**, 710-725. [Interlingua summary. Abst. from authors' conclusion.] **3613**

Rabbits, which developed haemolytic anaemia after the injection of serum from g. pigs immune to rabbit r.b.c., were resistant to subsequent injections, as a result of sensitization to the protein in g. pig serum.

HIRSCH, S. (1956). Etude histologique des réactions anaphylactiques au niveau de la circulation pulmonaire du lapin. **[Lesions of the pulmonary arterioles in anaphylactic shock in rabbits.]**—*C. R. Soc. Biol., Paris* **150**, 2266-2269. **3614**

Histological examination of the lungs of rabbits in a state of anaphylactic shock revealed constriction of the arterioles, and a considerable accumulation of leucocytes in the veins.

—M.G.G.

See also absts. **3487** (concentrated antigen for production of swine erysipelas serum); **3490** (bacterins containing Past. multocida and brucella agglutinins); **3499** (bacterial antibody in sheep serum); **3500** (variability of immune reactions in pullorum disease); **3501** (pullorum antigen); **3504-3524** (brucellosis); **3531** (bradsot and enterotoxaemia); **3534** (botulism); **3542** (polyvalent vaccine against paratyphoid, pasteurellosis and streptococcal infections); **3549** (bovine pleuropneumonia); **3551** (haemagglutination-inhibition test for control of PPLO in poultry); **3579** (c.f. antigen in brain of horses with Borna disease); **3590-3591** (swine fever); **3594** (maternal transfer in swine influenza); **3599-3600** (Newcastle disease); **3625-3626** (fascioliasis).

PARASITES IN RELATION TO DISEASE [GENERAL]

BÖHM, L. K. & SUPPERER, R. (1956). Beiträge zur Kenntnis tierischer Parasiten. II. **[Studies of animal parasites. II.]**—*Zbl. Bakt. I. (Orig.)* **167**, 170-177. **3615**

A report of interesting parasitological findings made by the authors in Vienna. *Eimeria ponderosa* oocysts were recovered from the faeces of 2 roe-deer; they were enveloped in a thick, yellowish-brown outer covering. Another roe-deer was found infested with *E. auburnensis*. *E. böhmi* was recovered from chamois. *Corrigia skrjabini* was found blocking the pancreatic ducts of 2 capercaillie (*Tetrao urogallus*); a detailed description of the trematode is given. Examination of a 7-week-old lamb which had died revealed *Dictyocaulus filaria, Ostertagia circumcincta, Trichostrongylus vitrinus, Nematodirus filicollis, Strongyloides papillosus, Chabertia ovina,* oocysts of *Eimeria faurei,* and four *Monieza expanza* 3—4 metres long. It is considered that the infection with *M. expansa* must have taken place by the middle of February when the lamb was a week old. Tetrathyridia were found beneath the pleura of an orang-utan (*Pongo pygmaeus*) which had died. Severe *Protostrongylus tauricus* infestation was found in a hare, for the first time outside Russia. *Ascaris vitulorum* has been found more frequently in recent years in calves 5—11 weeks old. Infection is considered to be prenatal. Eggs and larvae of an unidentified nematode were found in skin material from a lioness.—M.G.G.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

MURRAY, M. D. (1957). **The distribution of the eggs of mammalian lice on their hosts. 3. The distribution of the eggs of *Damalinia ovis* (L) on the sheep. 4. The distribution of the eggs of *Damalinia equi* (Denny) and *Haematopinus asini* (L) on the horse.**—*Aust. J. Zool.* **5**, 173-182 & 183-187. **3616**

I. Eggs of *D. ovis* are attached to the wool and hair fibres of the sheep. The distance of the newly laid eggs from the skin is determined by the extent of the temp. zone suitable for oviposition, which in turn is largely determined by skin temp. and topography, the depth of the air blanket trapped within the fleece, and atmospheric temp. Eggs are not found on bare areas of sheep, neither can they be laid on fibres of too great a diameter. As there are no areas of skin entirely covered with fibres of unsuitable diam. for oviposition, fibre diam. has little influence on lateral distribution. When sheep are exposed to low atmospheric temp., skin temp. of the extremities falls below that at which *D. ovis* can lay eggs. Skin temp. is the main factor which determines the lateral distribution of the eggs.

II. Eggs of both *D. equi* and *H. asini* are

attached to the hairs close to the skin, with the end of attachment nearest to the skin. The oviposition behaviour of *D. equi* is similar to that of *D. ovis*. Optimum temperatures for oviposition by *D. equi* lie between 32° and 38°C., and a fibre of suitable diam. is also required. *D. equi* cannot readily attach an egg to the coarse fibres of the mane, tail, face and legs, whereas *H. asini* can. Normally the fine hairs of the horse are shed twice a year, whereas the coarse hairs are not, so that there is a more severe reduction of the population of *D. equi* than of *H. asini*.

—R. I. SOMMERVILLE.

I. CLAY, T. (1957). **Systemic effect of dieldrin on the 'body louse' of poultry.** — *Nature, Lond.* **179,** 1357. **3617**

II. MCCOSKER, P. J. (1957). **Systemic effect of dieldrin on the 'body louse' of poultry.**— *Ibid.* 1357. **3618**

I. C. drew attention to the finding of Crutchfield & Hixson (1943) that *Eomenacanthus stramineus* feeds on blood as well as feathers.

II. Referring to his experiment reported previously [see *V.B.* **27,** 3025], M. stated that not only *E. stramineus,* but also *Goniocotes gallinae* and *Lipeurus caponis* fell in larger numbers from fowls given dieldrin than from control birds.—M.G.G.

AKÜN, R. & HOLZ, J. (1957). Gastrophilus-Larven als Ursache praecanceröser Veränderungen. [**Gasterophilus larvae as cause of precancerous lesions in the stomach.**] — *Tierärztl. Umsch.* **12,** 152-153. **3619**

In the cardia of a horse a papillomatous growth was found, which contained numerous *Gasterophilus* larvae.—M.G.G.

TESKEY, H. J. (1957). **Observations on the seasonal development of hypodermal larvae of the northern cattle grub, *Hypoderma bovis* (L) (Diptera: Oestridae) at Guelph, Ontario, and their implications in control programs.** —*Canad. J. anim. Sci.* **37,** 114-120. **3620**

The larval period of *H. bovis* was observed in southwestern Ontario in 1954 and 1955. The first appearance, peak appearance, first emergence, peak emergence, and last emergence of larvae were, respectively, the end of January, March, beginning of May, early June, and end of July (1955) or August (1954). Infestation periods averaged 203 days in 1954 and 184 days in 1955. Larval mortality in the host's back was 100% in 2 cows, but averaged 44 and 54% for all animals in the 2 years.—G. K. SWEATMAN.

ENIGK, K. (1956). Versuche zur Bekämpfung der Kriebelmücken. [**Control of *Simulium*.**] — *Wien. tierärztl. Mschr.* **43,** 738-746. [English, French and Italian summaries.] **3621**

Application to a stream of a dieldrin suspension in a concentration of 1 g. per cu. metre for 30 min. practically exterminated *Simulium* larvae for a distance of about 3 miles. This measure can only be applied to streams with few fish. Where the fish population is high spraying vegetation up to 100 yards from streams is recommended to kill adult flies. Using a motor sprayer the operation is carried out in late April and early September.—M. L. CLARKE.

DOWNE, A. E. R. (1957). **Precipitin test studies on rate of digestion of blood meals in black flies (Diptera: Simuliidae).** — *Canad. J. Zool.* **35,** 459-462. **3622**

Adult *Simulium* flies were allowed to engorge on horses or g. pigs. Precipitin tests enabled identification of the blood source in all instances for 24 hours after feeding. After 32 hours, 60 to 74% of the samples of ingested blood were identifiable, but few of the samples could be identified after 40 hours.—G. K. SWEATMAN.

NELSON, W. A., SLEN, S. B. & BANKY, E. C. (1957). **Evaluation of methods of estimating populations of the sheep ked, *Melophagus ovinus* (L.) (Diptera: Hippoboscidae), on mature ewes and young lambs.**—*Canad. J. anim. Sci.* **37,** 8-13. **3623**

Six methods of estimating sheep ked populations on ewes and lambs were compared with actual populations (picked-off count). The total live count method (count of all keds seen on both sides of body) was most accurate since it was shown that the ratios of sample counts to actual populations (range 0·61:1 to 0·81:1) were unaffected by variations in the degree of infestation, body size, or fleece characteristics. (A count of the keds on one side of the host gave a valid estimate.) Variable results were obtained using three methods of parting the wool vertically at 2-, 3- or 4-inch intervals. The 5-min. count method and the method of ten 12-inch vertical partings gave unreliable estimates.

—G. K. SWEATMAN.

RIEK, R. F. (1957). **Studies on the reactions of animals to infestation with ticks. I. Tick anaemia. II. Tick toxins.**—*Aust. J. agric. Res.* **8,** 209-214 & 215-223. [Absts. from author's summaries.] **3624**

I. Tick anaemia appears to be caused mainly by loss of the blood ingested by the

engorging ticks. It is possible that some toxic effects of the salivary secretion may help to account for the slow recovery of heavily infested animals in poor condition, even after the infestation has been removed and adequate feed provided.

II. Toxin was present in the eggs of 17 species of ixodid ticks; it is probably present in the eggs of all species of this family. It was associated with the globulin fraction of the egg extract, and was thermolabile. Similar toxin was present in the larvae of each of 4 species of ixodid ticks. The toxin was not present in the eggs of 5 species of argasid ticks studied. The clinical syndrome and the pathological changes in the tissues of laboratory animals after injection of egg extracts were studied. The toxin appeared to be quite distinct from the one that causes tick paralysis, which, in Australia, results from infestation with *Ixodes holocyclus*.

See also absts. **3555** (report, Nigeria); **3556** (longevity of tsetse flies infected with trypanosomes); **3571** (midges as intermediate hosts for Haemoproteus in ducks); **3575** (behaviour of rabies virus in ticks); **3789** (report, Somaliland).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

SHIBANAI, D., TOZAWA, M., TAKAHASHI, M. & ISODA, M. (1956). [**Experimental studies on vaccination against** *Fasciola hepatica*.] — *Bull. Azabu vet. Coll.* **3,** pp. 77-86. [In Japanese. Abst. from English summary.] **3625**

A "vaccine" against *F. hepatica* [details not given] was administered by various routes to 7 rabbits. 70 days later they were given metacercariae by mouth, and after a further 56 days they were killed and the livers were examined. Macroscopic and histological lesions were least severe (compared with 3 unvaccinated controls) in those inoculated s/c and i/d. Lesions intermediate in severity were seen in those inoculated i/p and by mouth.—R.M.

ICHIHARA, T., SUSUMI, S. & KURAMOTO, T. (1956). [**Studies on the diagnosis of fascioliasis. I. Antigens for the precipitation test. II. Precipitation test for fascioliasis in cattle. III. Precipitation test for fascioliasis in goats.**]—*Jap. J. vet. Sci.* **18,** 119-129; 131-135 & 137-140. [In Japanese. Absts. from English summaries.] **3626**

I. Purified antigens were prepared from mature *F. hepatica*. The purified polysaccharide was prepared by extraction with trichloracetic acid and fractionation with acetone. The lipid fractions were prepared by extraction with methanol or ethanol for a week at 30°C., and also by removal of the precipitates produced by this treatment for 2 days. Individually, the antigens were unsatisfactory, but good reactions were obtained with a complex antigen consisting of the purified polysaccharide and a lipid fraction. The optimum ratio of the two components was a dilution of 400–1600 for the polysaccharide when the lipid fraction dilution was 1:50. The precipitin which reacted with these antigens resisted heating at 63°C. for 7 min., but not for 10 min. There were no cross-reactions between these antigens and those prepared from *Paramphistomum cervi* by the same methods.

II & III. The precipitation test, using the complex antigen, was performed on 101 cattle infested with *F. hepatica*, 201 slaughter cattle, and about 150 goats. The test was specific, and was clearly positive for 90% of the infested animals, and doubtful for moderately infested animals.—M.G.G.

IVANOVA, Z. I. & KHITENKOVA, L. P. (1956). [**Anthelmintic properties of acriquine and aminoacriquine.**] — *Trud. gosud. nauchno-kontrol Inst. po Vetpreparatam* **6,** 302-311. [In Russian.] **3627**

Aminoacriquine is 2-methoxy-6-chloro-7-amino-9-(4-diethylamino-1-methylbutylamino) acridine hydrochloride; it is closely related to acriquine, which is mepacrine hydrochloride, and has a much lower oral toxicity. Aminoacriquine, given by mouth at a dosage of 0·15–0·2 g./kg. body wt., was stated to be 42·6% effective against larval *Moniezia* and 69% effective against adult *Moniezia* in sheep. A saline purgative was administered 2–3 days after treatment. Neither drug was effective against trichostrongyles in sheep or ascarids in pigs.—R.M.

OSHIO, Y. & FURATA, I. (1955). [**Histo-pathological studies on skin lesions due to cutaneous infestations with** *Strongyloides ransomi*.]—*Bull. nat. Inst. agric. Sci. Japan* Ser. G. No. 11. pp. 51-66. [In Japanese. English summary.] **3628**

Skin lesions caused by *Str. ransomi* larvae were studied in pigs, cats, rats and fowls. Mechanical damage to tissues by penetration of larvae was negligible. In the corium there was dilatation of lymph vessels, oedema, marked inflammation around blood vessels, and capillary congestion, but no haemorrhage.—E.G.

WEBBER, W. A. F., CRISP, G., WRIGHT, A. I. & WILLIAMS, P. (1957). **Records of** *Onchocerca*

found at postmortem examination of Welsh cattle.—*Trans. R. Soc. trop. Med. Hyg.* **51,** 295. [Abst. from authors' summary.] **3629**

Tissues from (Welsh, Irish and Cheshire) cattle slaughtered at Wrexham were examined: for adult worms, the gastro-splenic omentum and the connective tissue round the nuchal ligament; and for microfilariae, skin from the base of the ear and the sternal, inguinal and pastern regions. Adults were recovered from the first site in 31 and 263 and from the second in 44 of 249 animals; and microfilariae from the skin of 53 out of 164. About 25% of the Irish and 60% of the Welsh and Cheshire cattle harboured microfilariae or adult worms, or both.

DREZANCIC, I. J. (1957). **Papain as an anthelmintic for *Haemonchus contortus* in sheep.**—*Aust. vet. J.* **33,** 178-181. [Author's summary slightly modified.] **3630**

"Nematolyt" (papain) was shown to be a successful anthelmintic against *H. contortus*. It has some advantages over other anthelmintics as it is not toxic to the host and can be administered safely to young, sick or weak animals and to animals in advanced pregnancy. Its ability to destroy the eggs of *H. contortus* as well as the worms is of importance in the reduction of contamination of the pastures.

VODRÁŽKA, J., SOKOL, J. & BERECKÝ, I. (1956). K problematike liečby diktyokaulózy u oviec. **[Treatment of *Dictyocaulus* infestation in sheep.]**—*Folia Vet., Košice* **1,** 19-28. [In Slovak. German and Russian summaries.] **3631**

Lugol's soln. intratracheally, stibophen intratracheally or i/m, and "antimosan" i/m, did not remove all larval and adult forms of *Dictyocaulus* in 142 sheep.—E.G.

VODRÁŽKA, J., BERECKÝ, I. & SOKOL, J. (1956). O možnosti použitia emetoidných látok pri Mullerióze oviec. **[Emetine-like substances against *Muellerius* infestation in sheep.]**—*Folia Vet., Košice* **1,** 51-56. [In Slovak. German and Russian summaries.] **3632**

Synthetic substances related to emetine killed *Muellerius* larvae *in vitro*. Doses of 3 mg./kg. body wt. temporarily reduced the number of larvae in faeces. Further research on these substances is in progress.—E.G.

NISHIYAMA, S., WATANABE, S., TASHIRO, T. & MORIZONO, M. (1956). **[Experimental infection of horses with larvae of *Habronema muscae* or *Habronema microstoma*.]** — *Jap. J. vet. Sci.* **18,** 71-78. [In Japanese. Abst. from English summary.] **3633**

Experimental infection with *H. muscae* or *H. microstoma* larvae is described in 3 horses. The larvae were transplanted on to the anterior fetlocks or the skin immediately below the eye. The clin. and histopathological features were similar to those in natural cases of cutaneous habronemiasis. Both species penetrated the skin, causing inflammation. A new histopathological feature in the lesion below the eye was characterized by the infiltration of histiocytes, lymphocytes and fibroblasts around the larva in the corium.—M.G.G.

FERNANDO, S. T. (1957). **Cystitis in dog infected with *Spirocerca lupi*.**—*Ceylon vet. J.* **5,** 29-30. [Author's summary modified.] **3634**

An account of cystitis in a dog with *S. lupi* lodged in a nodule in the wall of the urinary bladder. Treatment with diethylcarbamazine acid citrate both *per os* and directly into the bladder did not kill the nematodes.

LINDQUIST, W. D. (1957). **The use of low level piperazine on pigs naturally infected with *Ascaris lumbricoides*.**—*Amer. J. vet. Res.* **18,** 508-510. [Author's summary modified.] **3635**

One fifth of a therapeutic dose (*i.e.*, 20 mg./kg. body wt.) of polymeric piperazine-1-carbodithioic acid given daily in the food one week before, and up to 6 weeks after infection did not prevent migration, nor did it completely remove *A. lumbricoides* larvae from 5 pigs. The effect of this dosage on mature worms may be different.

VODRÁŽKA, J., SOKOL, J. & BERECKÝ, I. (1956). Naše doterajšie skúsenosti s piperazínom. **[Experiences with piperazine.]**—*Folia Vet., Košice* **1,** 5-17. [In Slovak. German and Russian summaries.] **3636**

Efficacy of piperazine hydrochloride in doses of 0·25 g./kg. body wt. in 46 chicks was about 97% against *Ascaridia* and about 13% against *Heterakis*. Piperazine citrate in doses of 0·5 g. was 100% effective against *Ascaridia* in adult hens. In 31 chicks doses of 0·125 g. were 37% effective against *Ascaridia* and about 6% against *Heterakis*. In 19 young fowls 0·25 g./kg. body wt. of a 5% soln. of piperazine hydrochloride injected into the crop was 100% effective against *Ascaridia* and 38% against *Heterakis*, whereas doses of 0·125 g., applied similarly, were effective about 80% and 22% respectively. The 5% soln. was unsuitable for parenteral use because of its irritant effect. Ten pigs given *per os* 0·25 g./kg. body wt. piperazine hydrochloride mornings and evenings with their food, expelled 76·8% of their *Ascaris* burden. The drug was effective against immature worms.

Repeated application of piperazine hydrochloride *per os*, intratracheally or i/v in sheep had practically no effect on *Dictyocaulus, Muellerius* and *Dicrocoelium* infestation.

Toxicity tests in chicks showed that the drugs were practically harmless.—E.G.

VOORHORST, R. (1957). **Eosinophilia of mice experimentally infected with Ascaris.**—*Acta allerg., Kbh.* **11,** 170-171. [In English.] **3637**

Two groups of mice were each infected orally with either 3,000 or 30,000 fertile ascaris eggs; eosinophilia appeared between the 10th and 15th day, with an eosinophilic leucocyte count of up to 5,000/cu. mm. in both groups. The reaction was extremely variable in different animals and indicated a genetic influence. Parenteral injection of ascaris antigen also produced eosinophilia between the 10th and 15th day.—E.V.L.

ROBERTS, F. H. S. (1957). **The incidence and abundance of the gastro-intestinal helminths of cattle in the Tooradin district of South-eastern Victoria.**—*Aust. vet. J.* **33,** 174-177. [Author's summary modified.] **3638**

The results of a survey, based on egg counts and larval differentiation, of gastro-intestinal helminths of calves are recorded. *Cooperia oncophora, Ostertagia* spp. (*O. ostertagi*), and *Trichostrongylus* spp. (*T. axei*) were the most abundant species, and peaks of infestation were attained during the cooler months with a subsidiary peak in the summer for *Ostertagia*. Other species encountered in small numbers included *Strongyloides papillosus, Haemonchus placei, C. punctata, Bunostomum phlebotomum, Oesophagostomum radiatum,* and *Moniezia benedeni*.

HERLICH, H. & ROHRBACHER, G. H., JR. (1957). **Critical test of the efficacy of *n*-butyl chloride as an anthelmintic in cattle.**—*Vet. Med.* **52,** 329-330. [Authors' summary modified.] **3639**

Administered with phenothiazine, *n*-butyl chloride did not result in any increased efficiency over phenothiazine alone. *n*-Butyl chloride was completely ineffective unless closure of the oesophageal groove was effected by administration of 60 ml. of 10% sodium bicarbonate soln., 15 sec. before administration of the drug. Even after such closure, it was an unsatisfactory anthelmintic in cattle.

CAUTHEN, G. E. (1957). **Low level phenothiazine administration to weaned beef calves.**—*Amer. J. vet. Res.* **18,** 612-613. [Author's summary modified.] **3640**

In 1950, 40 untreated weaned calves with moderate subclinical parasitism grew as well but had a 26% greater faecal worm egg count than 41 similar calves which received 1 g. of phenothiazine in their food for 122 days. In 1951 and 1952, in 3 trials, 18 calves with moderate or moderate to heavy parasitism gained 25 to 60 lb. less and had 44 to 125% higher faecal worm egg counts than 17 calves which were fed 2 g. of phenothiazine daily for 88 to 179 days.

SHUMARD, R. F., BOLIN, D. W. & EVELETH, D. F. (1957). **Physiological and nutritional changes in lambs infected with the nematodes, *Haemonchus contortus, Trichostrongylus colubriformis,* and *Nematodirus spathiger*.**—*Amer. J. vet. Res.* **18,** 330-337. **3641**

Four young lambs, reared worm-free, were each dosed with 100,000 infective larvae of *T. colubriformis,* 40,000 *H. contortus* and 10,000 *N. spathiger,* and the physiological and nutritional effects were compared with four control lambs. *Post mortem* worm counts indicated wide differences in susceptibility to infection and its effects particularly in regard to the last two nematodes. Food consumption decreased progressively and weight loss was rapid. Water consumed per lb. of lamb did not appreciably decrease till debility occurred. Moisture content of the faeces varied with the type and severity of the infection but the faecal pH varied little. Infected lambs had hyperglycaemia with corresponding hypophosphataemia and hypoproteinaemia. Digestibility of protein gradually decreased while that of crude fibre fluctuated widely as the infection progressed. Depression of blood haemoglobin and haematocrit values occurred only in those lambs in which *H. contortus* was present. It is concluded that differences in initial susceptibility to the species of nematode used are inherent and probably species specific.—H. SCOTT MCTAGGART.

WISCHNJAKOFF, J. & KOMANDAREFF, S. K. (1957). Untersuchungen über die Wirkung des Präparates "Vermizym" bei einigen Helminthen des Hundes. **[Action of "Vermizym" against some helminths in dogs.]**—*Wien. tierärztl. Mschr.* **44,** 273-284. [English, French and Italian summaries.] **3642**

"Vermizym" (an activated, stabilized papain preparation) proved highly active *in vitro,* in all concentrations, against *Toxocara canis* and *Toxascaris leonina,* but only in high concentrations against *Uncinaria stenocephala.* Trials in 16 dogs showed it to be 100% effective against the first, 75% effective against the sec-

ond and ineffective against the third of these nematodes (single oral dose of 1 g./kg.). The different response in the *in vivo* trials was said to be partly dependent upon the localization and the stage of the infestation in each case.

—G. P. MARSHALL.

See also abst. **3572** (a protozoan parasite of helminths).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

DEL BONO, G. & EMDIN, R. (1956). Contributo alla patologia della colecisti bovina. **[Neoplasms of the gall bladder in cattle.]**—*Ann. Fac. Med. vet. Pisa* **9,** 226-236. [English and French summaries.] **3643**

Neoplasms in the gall-bladder of 2 slaughter steers were identified as adenoma and pseudo-adenoma respectively.—T.E.G.R.

BUSTAD, L. K., MARKS, S., GEORGE, L. A., JR. & SEIGNEUR, L. J. (1957). **Thyroid adenomas in sheep administered iodine-131 daily.**—*Nature, Lond.* **179,** 677. **3644**

The development of thyroid tumours in Suffolk sheep is reported following daily administration of I^{131}. The four affected animals were the offspring of ewes which had been dosed daily by mouth with 5 microcuries carrier-free I^{131} from two years of age until they were killed 3–4 years later, at which time no tumours were found in the dams. The affected lambs were thus exposed to I^{131} during foetal life and *via* the milk while sucking. After weaning at four months old they were dosed at the same rate as their dams until killed at 5½ years old. Six ewes of the same age which were exposed to 0·15 microcuries daily for their lifetime and 25 aged control sheep had no thyroid tumours. Animals dosed at 15 to 1800 microcuries daily developed no thyroid tumours either, but these groups were exposed for significantly shorter periods and were killed at an earlier age.

—H. SCOTT MCTAGGART.

MORGANTINI, F. (1956). Di un fibro reticolo sarcoma in un cane. **[Reticulo-endothelial cell sarcoma in a dog.]**—*Ann. Fac. Med. vet. Pisa* **9,** 58-67. [French and German summaries.] **3645**

The histology and classification of tumours of the reticulo-endothelial system are discussed and a detailed account is given of a fibroreticulosarcoma in a dog aged 2½ years.—T.E.G.R.

LARSSON, B. (1957). **Some aspects of canine mastocytoma.**—*Nord. VetMed.* **9,** 241-256. [In English. German and Swedish summaries.] **3646**

Observations were made on a series of 60 dogs with mastocytomas encountered over 3 years. The mean age of affected dogs was 7 years, and of the general dog population 4 years. Boxers were predisposed to mastocytoma, the mean age of affected dogs of this breed being lower than that of other affected dogs. No sex predisposition was noted. There was a predilection for the hind-limbs and trunk. The number of lesions on any one dog varied from one to 5, and in just under half the dogs there were multiple tumours.

Clinically and pathologically, the following types were distinguished: Type *Ia*: a firm, hairless, often ulcerated, black pigmented tumour, up to the size of a walnut, which might remain intact for several years. When it grows, it turns into either of two forms, *Ib* and *Ic*. Type *Ib* is hairless, soft, pseudo-fluctuating, often black pigmented, infiltrative but in the subcutis a well demarcated tumour. Type *Ic* is an enlarged type of *Ia* which is always ulcerated. Type *II* is rapidly growing and covered by hair but in other respects like type *Ib*. It is poorly demarcated in the deeper layers of the subcutis. Type *III* is a recurrence in an operation wound after *Ib*, *Ic* or *II* and has the appearance of granulation tissue.

Only 2 dogs (of 5 examined P.M., with type *II* tumours) showed metastases. Five cases each of types *Ib* and *Ic*, and 4 of type *II*, showed post-operative bleeding. Cortisone was without permanent effect in two inoperable cases.

—E. COTCHIN.

ISHITANI, R. (1956). **[Pathological studies on avian leucosis complex. II. Cytological studies on avian erythroleucosis. III. Histopathological studies on avian erythroleucosis.]**—*Jap. J. vet. Sci.* **18,** 88-98 & 99-107. [In Japanese. Abst. from English summary.] **3647**

75 experimental and 9 natural cases of erythroleucosis were studied. From examination of stained smears of blood and bone marrow, 4 types of cell picture were seen: erythroblastosis, alone or combined with thromboblastosis or myelosis; and all three conditions together. The lesions were typical and no macroscopic difference could be observed between the 4 cellular

types. Cytological study of the organs revealed hyperplasia of cells of the erythrocytic series in the liver sinusoids, and activation of reticulo-endothelial cells in the spleen, liver, and bone marrow. There are 24 photomicrographs of cells in blood, bone marrow and tissues.—R.M.

See also abst. **3699** (eosinophilic granuloma in a dog).

NUTRITIONAL AND METABOLIC DISORDERS

KEHAR, N. D. (1956). **Modern concepts of ruminant digestion and metabolism.**—*Proc. 7th Internat. Congr. Zootech., Madrid* Part 8. pp. 121-135. [In English.] **3648**

Investigations in India during the past 15 years on metabolism of various nutrients in ruminants have shown that the endogenous urinary nitrogen excretion of Indian cattle is lower than that reported for foreign animals as also is the maintenance protein requirement. Values for buffaloes are lower and for goats, higher than those for cattle. Tannic acid has been found to be one of the factors responsible for the lower digestibility of leafy protein. With milch cows, a higher production has been noted with oil seed cake processed by the local type of crusher than by the expeller or solvent extracting methods. Mineral requirements in Indian cattle depend on the species and on the nature of the feed, more calcium being required in animals getting paddy straw than wheat straw. A complete mineral mixture has been devised which is giving encouraging results.

—A. ACKROYD.

BROBERG, G. (1956). Vårmförskämming som primär sjukdomsorsak. **[Putrefaction in the rumen as a primary cause of disease.]**—*Nord. VetMed.* **8,** 935-952. [In Swedish. English and German summaries.] **3649**

Putrefaction of the rumen contents was observed after feeding with brewers' grains, rotten potatoes, bad silage, and excess protein in conjunction with bad hygiene; also after drinking contaminated water, *e.g.* water placed in pig-feeding buckets. Samples of rumen contents were obtained by the use of a special probang. Treatment included changing the food and administering 100 g. lactic acid in 8–10 litres of water.—R.M.

FLUX, D. S. & PATCHELL, M. R. (1957). **The effect of short periods of undernutrition after calving on the establishment of lactation in dairy cows.**—*N.Z. J. Sci. Tech.* Sect. A. **38,** 689-695. [Authors' summary copied *verbatim.*] **3650**

The effect on the initiation of lactation of underfeeding monozygous twin cows for five or ten days immediately after calving was investigated. Underfeeding for five days had little or no effect. Underfeeding for ten days caused maximum daily milk yields to be lowered, the difference being statistically significant only at the 10% level. Maximum daily milk yields were reached earlier in the cows underfed for ten days than in the controls or cows underfed for five days (difference highly significant). The solids-not-fat percentage of the milk of the cows underfed for ten days was depressed in early lactation, the constituent mainly affected probably being lactose. Butterfat percentage was increased. These differences disappeared soon after normal feeding started. The effects of underfeeding for ten days on the composition of milk given during the first three weeks of lactation were similar to those in previous studies, namely a rise in butterfat percentage and a fall in the percentage of solids-not-fat.

SINCLAIR, D. P., CLARKE, E. A. & FILMER, D. B. (1956). **A comparison of hogget thrift on perennial ryegrass and white clover.**—*Proc. N. Z. Soc. Anim. Prod.* **16,** pp. 23-28. Discussion: pp. 29-30. **3651**

"Hogget ill-thrift" may be defined as loss of weight in sheep (not only hoggets) on autumn pastures. The authors demonstrated that it occurred on perennial ryegrass pasture but not on white clover. They believed the condition to be due to inadequate intake of digestible dry matter by sheep grazing perennial ryegrass.

—R.M.

I. BELL, J. M. & BAKER, E. (1957). **Growth depressing factors in rapeseed oilmeal. II. Studies on counteraction by dietary supplements.**—*Canad. J. anim. Sci.* **37,** 21-30. **3652**

II & III. BELL, J. M. (1957). **Growth depressing factors in rapeseed oilmeal. III. Studies on counteraction by steam processing, extraction and dietary supplements. IV. Comparative feeding values of Argentine and Polish types and the effects of supplementary aureomycin, fishmeal, lysine, iodide and thyroid-active substances.**—*Ibid.* 31-42 & 43-49. **3653**

I. Mice fed rape-seed oil meal did not respond favourably to iodine and iodinated casein as has been reported for fowls and turkeys. Males appear to be more severely affected.

II. Water extraction, particularly with hot

water, reduced the growth-inhibiting effect as did hot alcohol extraction. Vitamin B_{12} effected some improvement. Iodine at 0·01% level and iodinated casein depressed growth. Enzyme inhibitors had no effect.

III. No marked differences were found between kinds of rapeseed oil meal. None of the supplements proved beneficial although fish meal and lysine modified the response to thyroid supplements. Findings are discussed in relation to apparently opposing results reported by other investigators.—D. MITCHELL.

OSER, B. L. & OSER, M. (1956). **Nutritional studies on rats on diets containing high levels of partial ester emulsifiers. II. Reproduction and lactation.**—*J. Nutr.* **60,** 489-505. **3654**

The effect of chronic ingestion of up to 20% of partial ester emulsifiers [see *V.B.* **27,** 1515] in the diet was studied in 3 generations of rats. Reproduction and lactation were not affected by a content of 5% in the diet. The survival of litters was affected in the groups receiving a 10% dietary content of Myrj 45, Span 60, or Tween 65, and in all the experimental groups receiving a 20% content. Lower weights at weaning were also observed. The effects were not much more severe in the third than in the first generation. Addition of 9% of vegetable fat to the diet improved the survival of the young in the groups receiving Myrj 45, Span 60, Tween 60, or Tween 80.—M.G.G.

ANON. (1956). **Procaine penicillin in animal nutrition.** pp. 53. Merck Service Bulletin. Rahway, New Jersey: Merck & Co., Inc. **3655**

A review of the literature on the effect of dietary penicillin on poultry, pigs and ruminants, with a chapter on the use of high levels of the antibiotic. (Over 200 references).—R.M.

RADISSON, J. J., BARTLEY, E. E., LORD, T. H. & SWENSON, M. J. (1956). **The mode of action of antibiotics in the nutrition of the dairy calf. II. Effect of aureomycin administered orally to young dairy calves on the sensitivity of intestinal bacteria to phagocytosis.**—*J. Dairy Sci.* **39,** 1386-1395. **3656**

Oral administration of aureomycin to calves did not materially affect the phagocytic activity of the leucocytes in their blood. But bacteria (salmonella and coliform species) isolated from the faeces of such calves were more sensitive to phagocytosis than bacteria isolated from the faeces of control calves. Phagocytic sensitivity was increased further when bacteria were grown *in vitro* in the presence of sub-bacteriostatic concentrations of aureomycin. Leucocytes from calves up to 2 weeks old were less phagocytic than leucocytes from calves 5–7 weeks old. Antibiotics may therefore play a greater part in the defence of the body during early life.—M.G.G.

CONIGLIO, J. G. & BELL, E. J. (1957). **The effect of antibiotics upon intestinal and hepatic lipogenesis.**—*J. biol. Chem.* **226,** 805-811. [Authors' summary modified.] **3657**

The incorporation of acetate (labelled with C^{14}) into fatty acids of the intestine, caeca, caecal contents, and liver of rats fed chlortetracycline plus streptomycin, neomycin alone, or a mixture of these antibiotics with sulphanilamide was compared with that of pair-fed controls. A decrease in caecal coliforms and lactobacilli induced by antibiotic feeding was not paralleled by a decrease in C^{14} incorporation into intestinal fatty acids. An increased total activity in fatty acids of the caecum and of the caecal contents was observed in the experimental rats. These findings indicate that, in the intact animal given labelled acetate, the intestinal flora does not contribute significantly to the high degree of labelling found in the intestinal fatty acids. Increased incorporation of acetate into hepatic fatty acids was found in all antibiotic-treated rats compared to pair-fed controls.

REID, C. S. W. (1956). **Limitations of present methods of controlling bloat in the field.** — *Proc. N. Z. Soc. Anim. Prod.* **16,** pp. 122-127. Discussion: pp. 127-129. **3658**

R. discussed pasture management, grazing control, and antifoaming agents. The latter included the spraying of "dangerous" fields with vegetable oil.—R.M.

HUGGETT, A. ST. G. & NIXON, D. A. (1957). **Use of glucose oxidase, peroxidase, and o-dianisidine in determination of blood and urinary glucose.** — *Lancet* **273,** 368-370. [Authors' summary slightly modified.] **3659**

A method for the routine determination of blood glucose is described which uses a mixed enzyme-oxygen acceptor reagent.

VOHRA, P. & KRATZER, F. H. (1956). **Graying of hair in rats fed a ration deficient in lysine.** —*Science* **124,** 1145. **3660**

Three black rats received a diet slightly deficient in lysine, which had caused depigmentation of the feathers in poults. Their hair became much lighter in colour and finer in texture than in 2 control rats. The experiment was repeated 3 times, with identical results.

—M.G.G.

SCHJEIDE, O. A. & URIST, M. R. (1956). **Proteins and calcium in serums of estrogen-treated roosters.** — *Science* **124,** 1242-1244. **3661**

An i/m dose of 125 mg. of oestrone was given to cockerels. Within 5 days the Ca content of the serum rose from 10 mg.% to about 130 mg.%, the content of chylomicrons and beta lipoproteins rose considerably, alpha lipoproteins almost disappeared, and at least 2 new components appeared. One was apparently a phosphoprotein, and most of the high concentration of Ca was associated with it. The second, a very dense lipoprotein, appeared to be identical with the livetin in egg yolk. It is considered that the 2 components are deposited in egg yolk as vitellin. They are soluble in plasma only as long as there are sufficient dializable materials to keep them separate. This mechanism may be similar to other processes in the deposition of insoluble structures in cells.—M.G.G.

WESTERLUND, A. (1956). **The metabolic behaviour of phosphorus. V.**—*Kgl. Lantbrukshögsk. Ann.* **22,** pp. 317-352. [In English. Swedish summary.] **3662**

W. discussed the work of E.B. Forbes *et al.* (1916–1922) and of Jarl [*V.B.* **24,** 1587] on the phosphorus metabolism of milch cows.—R.M.

KÖHLER, H. (1956). Zur Morphologie und Ätiologie der Ferkelanämie. **[Morphology and aetiology of anaemia in piglets.]**—*Mh. VetMed.* **11,** 706-711. **3663**

This account is based on the author's previous studies of the bone marrow in piglet anaemia. [See also *V.B.* **27,** 206 & 1842.]—R.M.

PLEVA, J. (1956). K predchádzaniu anémie prasiat vo vel'kochovoch. **[Prevention of anaemia in piglets.]**—*Folia vet., Košice* **1,** 215-221. [In Slovak. German and Russian summaries.] **3664**

Prevention of post-natal anaemia in piglets was claimed with "Ferronat C," an iron compound given to sows with their food for 30 days before and 30 days after parturition. Similar results were obtained when the preparation was given to piglets during the first 30 days of life.
—E.G.

HJÄRRE, A. & OBEL, A. -L. (1956). Kochsalzvergiftung als Ursache einer Meningo-Encephalitis eosinophilica beim Schwein. **[Sodium chloride as the cause of eosinophilic meningoencephalitis in pigs.]** — *Mh. VetMed.* **11,** Suppl. No. 2. pp. 690-693. **3665**

Over 100 cases of acute or chronic non-contagious meningoencephalitis had been observed in pigs in Sweden since 1940. Lesions were restricted to the inner layers of the cerebral cortex, and consisted of oedema and pronounced infiltration with eosinophilic leucocytes. In all cases the pigs had been fed fish waste (mainly herring) containing salt. A similar condition was produced by administering sodium chloride or sodium lactate (but not by ammonium chloride) to pigs and restricting their water intake. It was suggested that the sodium ion was responsible for the brain lesions. [See also *V.B.* **27,** 2159.]—R.M.

ANDREWS, E. D. (1956). **Cobalt deficiency.**—*N.Z. J. Agric.* **92,** 239 & 241-244. **3666**

Areas in New Zealand which are severely deficient in cobalt, giving rise to clinical symptoms in cattle and sheep, are now fairly well defined and appropriate measures are taken. There are, however, other areas where the soil deficiency is only slight or moderate. Such areas do not give rise to clin. symptoms in cattle or mature sheep, but growing lambs, being more sensitive to cobalt deficiency, may be affected in varying degrees. The diagnosis of cobalt deficiency in these areas is discussed, together with appropriate control measures and the improvements to be obtained by them.
—W. H. PARR.

KRUYT, K. J. (1956). Het kopergehalte van het bloedplasma van de normale melkkoe in de Krimpenerwaard. **[Copper content of the blood plasma of normal milch cows in the Krimpen district.]**—*Thesis, Utrecht* pp. 179. [In Dutch. English, French, German and Polish summaries. Abst. from English summary.] **3667**

For 12 months 100 ml. of blood were taken weekly from the mammary vein of 18 cows on 6 typical farms in the district. The soil consists of peat, covered in places by river silt; the Cu content is about 8 mg./kg. In samples of grass the Cu content ranged from 7·3 to 17·3 mg./kg. dry matter (average 12·8 mg./kg.) and in hay from 5 to 7·3 mg./kg. The Cu content of the blood plasma varied considerably; it was at its highest in April and May (average content 86 μg./100 ml.) and at its lowest in November (average content 42 μg./100 ml.). The influence of climate, nutrition or state of health on blood Cu content could not be established.—M.G.G.

DEIJS, W. B., BOSCH, S. & WIND, J. (1956). De minerale samenstelling van weidegras in verband met kopergebrek bij rundvee. **[Mineral composition of pasture grass in relation to hypocupraemia in cattle.]**—*Versl.*

Inst. landb. Onderz., Wageningen pp. 88-100. (1955). **3668**

When the figure obtained by subtracting the amounts (in terms of m.eq./kg.) of P_2O_5 and SO_4 from the amount of CaO in pasture grass was low (−389 m.eq./kg.), more Cu was required for the maintenance of health in cattle grazing the pasture, than when the figure was high (−277 m.eq./kg.). This figure was more closely related to conditioned hypocuprosis than the base-acid ratio previously studied.

—R.M.

CHESTER, R. D., MARRIOTT, S. & HARVEY, J. M. (1957). **Observations on topdressing a copper-deficient pasture in south-eastern Queensland.**—*Qd. J. agric. Sci.* **14,** 1-22. [Authors' summary modified.] **3669**

Trials were conducted on the effect of top-dressing with copper sulphate, alone and in combination with superphosphate plus lime, on the botanical and chemical composition of pasture and on the growth rate of grazing Hereford heifers. The pasture was predominantly narrow-leaved carpet grass (*Axonopus affinis*) with limited amounts of paspalum (*P. dilatatum*) and white clover (*Trifolium repens*). The two last-named species maintained higher average copper levels than the carpet grass in all treatments, but did not contribute significantly to the animals' diet.

Top-dressing with copper sulphate every 6 months at 14 lb. per acre was necessary to maintain an adequate copper status in grazing cattle. This high requirement may be related to the poor retention of copper by the dominant pasture, to high rainfall and poorly developed soil structure. All animals had an unsatisfactory blood inorganic phosphate status, particularly during the winter. Top-dressing with superphosphate at 187 lb. per acre per annum did not markedly improve this condition. It is suggested that phosphate as well as copper may limit the growth rate of cattle in this area. The data on live weight show that cattle with adequate liver copper gained no better in summer–autumn and lost no less in winter than the copper-inadequate control animals. Parenteral copper therapy every 3 months maintained a satisfactory liver copper reserve in cattle grazing untreated pastures. Cobalt-supplemented cattle during the period Sept.–Nov. tended to make more satisfactory weight gains than untreated animals.

I. REID, B. L., KURNICK, A. A. BURROUGHS, R. N., SVACHA, R. L. & COUCH, J. R. (1957). **Molybdenum in poult nutrition.**—*Proc. Soc. exp. Biol., N.Y.* **94,** 737-740. **3670**

II. KURNICK, A. A., REID, B. L., BURROUGHS, R. N., STELZNER, H. D. & COUCH, J. R. (1957). **Effect of distillers dried solubles and molybdenum on the growing chick.**—*Proc. Soc. exp. Biol., N.Y.* **95,** 353-356. **3671**

I. The authors had previously found that the addition of sodium molybdate, distiller's dried solubles (containing 1·8 p.p.m. Mo), or the ash of the solubles increased the growth rates of chicks and turkey poults [*V.B.* **27,** 852 & 1175]. The present work demonstrated that these supplements increased the xanthine dehydrogenase activity of liver and intestine. (The unsupplemented diet contained 1·58 p.p.m. Mo.)

II. Ash of distiller's solubles from which the Mo had been extracted no longer increased the growth rate or the xanthine dehydrogenase activity of chicks.—R.M.

ANON. (1957). **White muscle disease in sheep controllable by topdressing with iron and magnesium. Report of New Zealand experiment.**—*N.Z. Agriculturist* **9,** 6-7. **3672**

A flock was grazed from lambing throughout lactation in 3 groups, on pastures top-dressed with superphosphate, magnesium and iron; superphosphate and magnesium; and superphosphate only. In the first group there was no case of white muscle disease; in the second 2 cases and in the third 12. In the next year the whole farm was top-dressed with a mixture of superphosphate, magnesium, iron, cobalt and copper and no cases of white muscle disease occurred. The significance of these results in relation to a similar syndrome in sheep in other countries, for which a deficiency of vitamin E has been tentatively postulated, is discussed.—E.V.L.

VITALE, J. J., HEGSTED, D. M., NAKAMURA, M. & CONNORS, P. (1957). **The effect of thyroxine on magnesium requirement.**—*J. biol. Chem.* **226,** 597-601. [Authors' summary copied *verbatim.*] **3673**

Growth inhibition in young rats produced by the addition of thyroxine to the diet is partially overcome by extra supplements of magnesium. The amount of magnesium required is related to the amount of thyroxine added, clearly demonstrating an elevation of the magnesium requirement by thyroxine. Magnesium is not, however, capable of completely preventing the thyroxine-induced growth depression. The oxidative phosphorylation of mitochondrial preparations from the hearts of these animals was impaired in the thyroxine-treated animals and raised to normal by high levels of dietary magnesium.

REDFEARN, E. R. & STRANGEWAYS, D. H. (1957). **The distribution of protein-bound sulphydryl and disulphide groups in various tissues of the vitamin A-deficient rat.**—*J. Anat., Lond.* **91**, 391-397. [Abst. from authors' discussion.] **3674**

The widely accepted theory that keratinization in epithelial tissues involves a complete oxidation of protein-bound sulphydryl (—SH) groups to disulphide (—SS—) groups above the Malpighian layer is not substantiated by the results of the present study. In addition to —SS— groups, —SH groups were found in appreciable concentrations in the cornified layers of stratified squamous epithelia of normal animals and of epithelia undergoing hyperkeratinization and keratinizing metaplasia in vitamin A-deficient animals. Thus these results have confirmed and extended the work of others who found that —SH groups were present in the stratum corneum of normal epithelial tissue. It was confirmed that in the formation of hair keratin there is a complete oxidation of —SH to —SS—.

GOLDSTEIN, J. & SCOTT, M. L. (1956). **An electrophoretic study of exudative diathesis in chicks.**—*J. Nutr.* **60**, 349-359. **3675**

Electrophoretic analysis of the proteins in the plasma of chicks with experimental exudative diathesis revealed a fall in the content of total protein, particularly albumin. The electrophoretic pattern of the exudate fluid was similar. Chicks recovered completely after oral administration of 0·25 ml. of pure δ-α-tocopheryl acetate.—M.G.G.

NORTH, J. D. K. & SINCLAIR, H. M. (1956). **Nutritional neuropathy. Chronic thiamine deficiency in the rat.**—*Arch. Path.* **62**, 341-353. **3676**

Definite histological signs of nerve degeneration were observed in the distal segments of the sciatic and posterior tibial nerves of some of the 28 rats fed a thiamine deficient diet until moribund (average survival time 156–165 days). Only 3–5% of the nerve fibres were affected and counts of myelinated fibres in the peroneal nerve of the thiamine deficient rats did not differ significantly from those of the inanition control animals. Inanition did cause some changes in the peripheral nerves, particularly blackening of the fibres with the modified Marchi staining method.—A. ACKROYD.

HOWES, C. E. & HUTT, F. B. (1956). **Genetic variation in efficiency of thiamine utilization by the domestic fowl.**—*Poult. Sci.* **35**, 1223-1229. **3677**

The thiamine content of eggs from White Leghorn hens averaged 1·98 μg./g. of yolk, and in eggs from heavy breeds (Rhode Island Red and Plymouth Rock) it average 1·38 μg./g. This was interpreted as demonstrating more efficient utilization of thiamine by White Leghorn hens.—R.M.

MILLER, E. R., SCHMIDT, D. A., HOEFER, J. A. & LUECKE, R. W. (1957). **The pyridoxine requirement of the baby pig.**—*J. Nutr.* **62**, 407-419. [Authors' summary modified.] **3678**

A synthetic milk diet supplemented with 0·5, 0·75, 1, and 2 mg. of pyridoxine per kg. of solids was fed to piglets to determine their requirement for this vitamin. An analysis of the growth and feed consumption data indicated that 0·5 mg./kg. was nearly adequate. However, data obtained on blood haemoglobin, r.b.c. and lymphocyte counts indicated that the minimum requirement was not less than 0·75 mg. of pyridoxine per kg. of solids. With respect to urinary xanthurenic acid, however, 0·75 mg. of pyridoxine per kg. solids was inadequate. It would thus appear that for more complete well-being the requirement is greater than 0·75 mg. but probably less than 1 mg. of pyridoxine per kg. solids. Classical deficiency symptoms were observed in controls receiving no pyridoxine. The performance of pair-fed controls indicated that the effects on the blood and urine components in deficient pigs were specifically due to pyridoxine deficiency and not effects of the resulting inanition.

SANTLER, J. E. (1957). **Growth in the cell populations of the thyroid gland of rats treated with thiouracil.**—*J. Endocrin.* **15**, 151-161. [Abst. from author's summary.] **3679**

In male albino rats treated with thiouracil, both the follicular and stromal cells in the thyroid gland increased in number, the increase in the stromal cell population being relatively greater. The mitotic rates for both types of cell were estimated. The maximum mitotic rates were seen in the group that had received 6 days' thiouracil treatment, after which there was a decline.

SONODA, M., SAKAMOTO, T., YAMAGUCHI, M., NAKAMURA, R., KANEKO, I. & KIMURA, S. (1957). **Clinical and biochemical studies on the basis of ketone bodies in cattle. II. Urine ketone bodies in normal dairy cattle.**—*Jap.*

J. vet. Res. **5**, 3-13. [In English. Abst. from authors' summary.] **3680**

The concentration of ketone bodies in the urine of 368 clinically healthy cows varied so widely that the animals were statistically divided into 2 groups: "normal" and "subnormal" groups. The mean concentrations in the normal group were 6·19 mg. total ketone and 1·25 mg. free acetone per 100 ml., and in the subnormal group 122·5 mg. total ketone and 54·5 mg. free acetone per 100 ml.

Ho, P. & Reber, E. F. (1957). **Effects of glucagon on hypoglycemia and ketonemia in pregnant ewes.**—*Amer. J. vet. Res.* **18**, 342-344. **3681**

Glucagon, administered i/v at 1–2 mg. per kg. body wt. to pregnant ewes in which hypoglycaemia and ketonaemia had been induced by starvation for 5–7 days, produced a significant rise in blood glucose, and decrease in blood ketones. The maximum effect occurred in 45 min. in ewes in early pregnancy and 60 min. in late pregnancy. Oxaloacetic acid administered with glucagon did not produce any additive effect.—H. Scott McTaggart.

See also absts. **3792** (book, animal nutrition); **3793** (book, vitamin A); **3796** (book, amino acids).

DISEASES, GENERAL

Dubois, L. & Conzemius, V. (1956). L'aviculture de rapport et la basse-cour familiale dans la région de Léopoldville. [**Feeding, management and disease of fowls in the Belgian Congo.**]—*Bull. agric. Congo belge* Suppl. 47. pp. 204. **3682**

In this publication there are chapters on breeds of fowls kept in the Leopoldville region, housing, incubation, chick rearing, nutrition and economic aspects of poultry farming. Nearly half of the report deals with diseases of fowls. There are sections on nutritional diseases, neoplasms and leucaemic conditions, infectious diseases, and internal and external parasites. There is a note on legislation concerning poultry in the Belgian Congo, and a bibliographical list of about 60 references.

—E.G.

Fried, K. & Hrudka, F. (1956). Niektoré poznatky o enzootickom mozgovomiechovom ochorení koní na východnom Slovensku. I. Časť: Klinický obraz a terapia. II. Časť: Epizootológia a etiológia. III. Časť: Histologický obraz. [**A form of encephalomyelitis in horses in Slovakia. I. Clinical picture and treatment. II. Epizootiology and aetiology. III. Histology.**]—*Folia vet., Košice* **1**, 273-282; 283-294; 295-309. [In Slovak. German and Russian summaries.] **3683**

I. The clinical picture of the disease is variable. Icterus of varying intensity is a feature. There is cardiac excitability and arrhythmia. Frequently, but not always, there is respiratory catarrh, dyspnoea and difficulty in micturition, and constipation. There may be depression, somnolence, irritability, disturbances in sensory perception, sighing and groaning . Disturbance in locomotory coordination may lead to paresis. The second, seventh and ninth cranial nerves may become involved in the syndrome. There is contraction of abdominal and anal muscles and spasm of the neck and limb muscles.

II. The disease affects all Equidae, except foals up to one year of age. It occurs mainly in or near river valleys. First cases generally occur in November, incidence being highest in January-February, after which there is a gradual decrease and by May outbreaks cease. The disease does not seem to be transmitted from dam to offspring *via* the placenta, nor to be contagious. Attempted experimental transmission to horses and other animals failed, and virus neutralization tests with Western and Eastern type viruses and with human encephalomyelitis of the type occurring in Czechoslovakia, were negative. Enterotoxic mycoses, botulism and *Equisetum* poisoning were excluded.

III. Material from 12 horses was examined, of which 2 died, 4 were slaughtered *in extremis*, 3 had been ill for some time, and 3 had recovered from the disease. There were lesions in ganglion cells of the spinal medulla, the cerebellum and, less frequently, the cerebrum. The c.n.s. was oedematous, with small scattered haemorrhagic spots, blood vessels were injected and there was endothelial irritation. Not conforming with typical encephalomyelitis was the absence of a reaction in the vascular mesenchyma, perivascular cell infiltration and proliferation of neuroglia. Massive haemorrhages were present in the leptomeninges and in the epineurium of some limb nerves. In horses which had been ill for a time there were nearly always degenerative, intrafascicular lesions and concentric, lamellar fibromatous formations. There was atrophy of the central and intermediate lobes of the liver, together with hyperplasia of parenchyma cells. Reticular proliferation was negligible. There was no cirrhosis.

—E.G.

BEREZHKOV, N. K. (1955). **[Cytological study of suppurative arthritis in horses.]**—*Trud. buryat-mongol. zootech.-vet. Inst.* No. 9. pp. 125-141. [In Russian.] **3684**

The number of cells in exudate from joints and tendon sheaths was greatest at the acute stage of inflammation, in cases where the prognosis was good. Subsequent decrease paralleled clinical improvement. During the first days of acute inflammation the commonest cells were polymorphonuclear neutrophiles; they decreased during later stages. Cells of the lymphoid-histiocytic series were absent or rare at first, and increased later, but never reached a large proportion.

At the beginning of acute inflammation the majority of neutrophiles showed degenerative changes, but pycnosis and rhexis did not occur until later. In purulent inflammation the number of cells amounted to several million per cu.mm., while in serous inflammation they did not exceed tens of thousands/cu.mm. The proportion of cells of the lymphoid-histiocytic series was always higher in serous than in acute purulent inflammation.—R.M.

BROWN, C. W. & CLARKE, C. E. (1956). **Some notes on a case of rupture of the bladder in a cow.**—*Vet. Rec.* **68,** 1047-1048. **3685**

The ruptured bladder of a cow which had recently calved was everted through the urethra and the tear sutured. The animal died 1½ days later, but P.M. examination showed that the bladder was healing. Possible causes of the rupture were a full bladder at parturition, an inflamed vagina blocking the urethra, or a violent contusion of the abdominal wall.
—M.G.G.

GOLOSOV, I. M. [Edited by.] (1956). **[Veterinary problems in reindeer breeding. Proceedings of the Agricultural Research Institute for the Northern Territories. Vol. 3.]** pp. 152. Leningrad: Sel'khozgiz. 4r. 75k. [In Russian.] **3686**

The most important problems discussed in this collection of 22 papers were bronchopneumonia and foot rot (both treated with sulphonamides) and warble flies (treated by spraying or dressing with pyrethrum, D.D.T. or B.H.C.). Other topics dealt with by various authors included mange, bursitis (thought to be due to brucellosis), seasonal changes in the skin of the limbs, anatomy of the anterior laryngeal nerve, and blood transfusion.—R.M.

I GOLOSOV, I. M. (1956). **[Bronchopneumonia in reindeer and its control.]**—*Trud. nauchno-issled. Inst. sel'sk. Khoz. krainego Severa* **3,** 5-13. [In Russian.] **3687**

II. GOLOSOV, I. M. & BONDAREVA, S. T. (1956). **[Role of external conditions in the aetiology of bronchopneumonia in reindeer.]** —*Ibid.* 14-20. [In Russian.] **3688**

III. METELEVA, R. I. (1956). **[Nature of the microflora in reindeer calves with pneumonia.]**—*Ibid.* 21-24. [In Russian.] **3689**

I–III. Bronchopneumonia accounted for about 25% of deaths in reindeer herds in the Far North of the U.S.S.R., and was more common in young animals. Its incidence was related to climate, and it could be prevented by the provision of adequate shelter and good food. A mixed bacterial flora was isolated, and it was concluded that bacteria were present only as secondary invaders.—R.M.

LOPPNOW, H. (1956). Untersuchungsergebnisse über die Pathogenese der Euterödeme. **[Pathogenesis of mammary oedema.]**—*Mh. VetMed.* **11,** 704-706. **3690**

L. discussed primary, non-inflammatory, abnormal mammary oedema in cows, to be distinguished from physiological oedema and inflammatory oedema occurring in acute mastitis.—R.M.

TIMONEY, J. F. (1956). **Oedema disease of swine.**—*Vet. Rec.* **68,** 849-851. **3691**

Supernatant fluid from the centrifuged contents of the small intestine of natural cases of oedema disease was able to produce the disease after storage for 11 months at about 20°F. Bowel supernatant fluid heated to 60°C. for 15 min. produced fatal oedema disease when it was inoculated i/v into a pig. Fluid heated to 65° or 70°C. did not produce the disease. The factor responsible for the disease was demonstrated in the contents of the small intestine but not in the gastric contents of natural cases. Two pigs were given i/p and i/m inoculations of alum-precipitated material derived from supernatant fluid treated with formalin, together with i/v inoculations of untreated supernatant fluid. Sera from these pigs protected 24 out of 25 pigs injected i/v with supernatant fluid, whereas 22 out of 24 control pigs died from oedema disease or were slaughtered *in extremis*. Serum from a pig immunized with a haemolytic Gram-negative organism of coliform type protected all of 4 pigs given bowel supernatant, whereas the 4 controls developed oedema disease.—M.G.G.

ANDREWS, J. S., SPINDLER, L. A., EARL, F. L. & DIAMOND, L. S. (1957). **Atrophic rhinitis.**

VIII. The albino rat as an experimental carrier.—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago,* 1956 pp. 273-282. [Authors' summary modified.] **3692**

Infective material causing atrophic rhinitis in pigs produced typical lesions of the disease after passage in the nose of the albino rat for 9 days to about 3 weeks. Rats might carry the causative agent(s) of atrophic rhinitis from infected to uninfected premises.

GOUGE, H. E., BOLTON, R. & ALSON, M. C. (1956). **The effect of feeding chlortetracycline to pigs with atrophic rhinitis.** In "Antibiotics Annual 1955/56". pp. 768-772. [New York: Medical Encyclopedia Inc.] **3693**

The addition to the food of 50 g./ton of chlortetracycline reduced the time it took for pigs with atrophic rhinitis to reach a body weight for 200 lb.—R.M.

BLOOD, D. C. (1957). **Enzootic metritis of sows.** —*Aust. vet. J.* **33,** 181-183. [Author's summary modified.] **3694**

There was a high incidence of post-natal fever, apparently due to uterine infection, in a herd of pigs. Mortality was low but deaths of piglets due to lack of milk in the sows caused considerable loss. The manner of spread suggested an infectious agent transmitted by coitus. Administration of penicillin or streptomycin was followed by prompt recovery. Posterior pituitary extract, injected immediately after farrowing, may have reduced the severity and the incidence of the disease. The cause was not identified.

GROTH, W. (1956). Die Beteiligung der Nebennierenrinde am Krankheitsgeschehen. (Morphologische Untersuchungen der Nebennieren von gestorbenen Ferkeln.) **[Participation of the adrenal cortex in disease : morphological studies of the adrenals of dead piglets.]**—*Arch. exp. VetMed.* **10,** 453-470. **3695**

Adrenal function in 42 dead or killed piglets was assessed by measuring the diameter of 200 cells in the external fascicular zone, the thickness of the cortex and the glomerular zone, and the weight of the gland. Normal values were established from 5 piglets aged between 5 days and 10 weeks. Increased function occurred in some cases of fatal syncope, bronchopneumonia, and swine fever. Subnormal function occurred in cachexia, in piglets born weak, and in "Ferkelruss" (eczema). Treatment with ACTH or other adrenal hormones was indicated in cases of subnormal function (although expense at present precluded general use).—R.M.

CANDLIN, F. T. (1956). **Chronic solar dermatitis of the dog.**—*Vet. Med.* **51,** 523-527. **3696**

A skin disease of the nose and eyes, occurring particularly in the Collie breed, was described as chronic solar dermatitis. Treatment with mepacrine hydrochloride (50 mg. twice daily by mouth) was recommended.—R.M.

STEVENS, C. E., SELLERS, A. F. & CLARK, J. J. (1956). **Studies on experimental canine interstitial nephritis. II. An attempt at functional-morphological correlation in damaged kidneys.**—*Amer. J. vet. Res.* **17,** 710-719. [For part I, see *V.B.* **26,** 3617.] **3697**

In 8 bitches the urinary bladder was explanted so that urine could be collected separately from each ureter. Unilateral interstitial nephritis was established by injection of lithium carmine or *Staph. aureus* toxin into one of the renal arteries. Urine was analysed and the glomerular filtration rate and renal plasma flow were calculated before and after injection. It was found that the presence of albumin and epithelial cells in the urine gave only an approximate indication of kidney damage: the best indication was the presence of casts.—R.M.

SALUTINI, E. (1956). Uremia ed alterazioni elettrocardiografiche nel cane. **[Electrocardiographic changes in uraemia in the dog.]** —*Ann. Fac. Med. vet. Pisa* **9,** 332-344. [English and French summaries.] **3698**

Electrocardiographic changes were observed in only 5 of 22 dogs affected with uraemia and consisted of disappearance of the P wave, prolongation of the QT interval and a deep characteristic T wave. It is considered that these effects may be due to electrolytic imbalance and are not typical of uraemia.—T.E.G.R.

SALERNO, G. (1956). Di un raro caso di granuloma eosinofilo a localizzazione cutanea osservato nel cane. **[Eosinophilic granuloma of the skin in a dog.]**—*Ann. Fac. Med. vet. Pisa* **9,** 68-77. [English and French summaries.] **3699**

A clinical and histological account of an eosinophilic granuloma involving the preputial orifice in a 10-year-old dog.—T.E.G.R.

CAMPBELL, A. M. G. (1957). **Polyneuritis and illness in cats.**—*Brit. med. J.* May 18th, 1183; August 10th, 354. **3700**

C. reported an apparent association between

acute polyneuritis in human beings and an influenzal disease (? feline enteritis) in cats owned by the patients. Two other correspondents [*Brit. med. J.* July 13th, p. 100 and July 27th, p. 237] gave examples of the same coincidence. —R.M.

LAWSON, D. D. (1957). **Otitis media in the cat.**—*Vet. Rec.* **69,** 643-647. **3701**

In 18 cases of otitis media the neurological signs were locomotor disturbance and malposition of the head; the degree of systemic illness varied considerably and temperature was mostly normal. The diagnosis was confirmed by radiography and at P.M. examination of 5 cats there was gross thickening of the mucoperiosteal lining with green pus containing streptococci and staphylococci.—E.V.L.

LÖLIGER, H.-C. (1956). Lungenadenom und Fussödem beim Nerz. [**Adenoma of the lungs associated with oedema of the paws in mink.**] —*Dtsch. tierärztl. Wschr.* **63,** 502-503. **3702**

Papillary adenoma in the left pulmonary lobe, associated with oedema of the paws is described in 2 mink. Bacteriological examination was negative.—M.G.G.

LIPPINCOTT, S. W., LEWALLEN, C. G. & SHELLABARGER, C. J. (1957). **Pathology of radioisotopic ablation of the thyroid in the dog.**—*Arch. Path.* **63,** 540-556. **3703**

Eight dogs were given a single dose, in their food, of I^{131} ranging from 0·063 to 0·98 mc/kg. body wt. and were observed for 14½ months. All developed myxoedema with 50% to 98% skin area devoid of hair. P.M. examination revealed virtually complete ablation of the thyroid and cellular degeneration of anterior pituitary glands.—E.V.L.

NOZAKI, H., MAKINO, K., FURUKAWA, M. & FURUTA, I. (1955). [**Effect of feeding "Bikini ashes" (1954) on animal products. II. Egg.**] —*Bull. nat. Inst. agric. Sci. Japan* Ser G. No. 11. pp. 89-98. [In Japanese. English summary.] **3704**

An account of feeding experiments in laying hens with radioactive ash. The degree of contamination by radioactive elements of different parts of the eggs was studied. The shells contained the largest amount of radioactivity, yolk and white only about 0·15% of the dose fed.—E.G.

LEWIN, S. (1957). **Planned restriction of radioactive uptake by animals.**—*Brit. vet. J.* **113,** 380-385. [Author's summary modified.] **3705**

Methods of decreasing the ingestion and absorption of Sr^{90} by animals are advanced on the basis of physical, chemical and biochemical considerations and of experimental work. Cattle on pastures deficient in Ca have more Sr^{90} in their bones, not only because of low Ca/Sr ratios, but also because of a deficiency in anions forming strontium salts which are more insoluble than the corresponding calcium ones. Lines of future research are advocated.

BROWN, J. M. M. (1957). **Refresher courses in physiology. II. The physiology of the liver in health and disease with reference to clinical patterns of hepatic dysfunction.**—*J. S. Afr. vet. med. Ass.* **28,** 85-105. [Author's summary slightly modified.] **3706**

A brief review of the normal physiology of the liver is presented, followed by a short note on the pathogenesis of liver dysfunction in general and a discussion of the disordered physiology which may be expected in liver disease. A short discussion on the clinical patterns of liver dysfunction is given.

UVAROV, O. (1956). **Some aspects of renal disease—with special reference to diagnosis. Pts. I. & II.**—*Vet. Rec.* **68,** 1005-1013 & 1033-1036. Discussion: pp. 1036-1038. **3707**

U. described some aids to the diagnosis of renal disease in large and small animals, discussed the literature on bovine pyelonephritis, chronic bovine haematuria and—in small animals—on uraemia, "rubber jaw" and urolithiasis, as well as renal conditions in the presence of other, including neoplastic, diseases, and concluded by outlining treatment with the various antibiotics. Further points of interest, particularly regarding the pathology, diagnosis and incidence of various forms of renal disease, were raised in discussion on the paper. —G. P. MARSHALL.

POISONS AND POISONING

HOUGH, W. H. & CARMAN, G. M. (1957). **Note on LD_{50} for sheep of ethylenediamine dihydriodide.**—*Canad. J. anim. Sci.* **37,** 121. **3708**

Of 20 ewes given daily 10 gr. ethylenediamine dihydriodide, 10 died between the 8th and 16th day of treatment. Death was attributed to iodism.—G. K. SWEATMAN.

WANNTORP, H. (1956). Chemie und Toxikologie der wichtigsten Schädlingsbekämpfungsmittel.

[Chemistry and toxicology of wood preservatives, rodenticides and insecticides.]—*Mh. VetMed.* **11,** Suppl. No. 2. pp. 652-662. **3709**

A review of the chemistry and toxicology of coal tar products (creosote, solignum, chlorinated hydrocarbons, and nitrophenols), arsenicals used as wood preservatives, rodenticides and chlorinated and phosphoric acid ester insecticides in domestic animals, as gleaned from the literature and from statistics in Sweden.

—G. P. MARSHALL.

KÖHLER, H. (1956). Pathologisch-anatomische Veränderungen bei Tieren durch moderne Rodentizide, Holzimprägnierungsmittel, Pflanzenschutzmittel, Insektizide und einige andere moderne Produkte der chemischen Industrie. **[Lesions in animals caused by rodenticides, wood preservatives, agricultural sprays, insecticides and some other modern chemical products.]**—*Mh. VetMed.* **11,** Suppl. No. 2. pp. 669-675. **3710**

K. reviewed the literature on the incidence and morbid anatomy of poisoning, in domestic animals, with rodenticides (metallic phosphides, thiourea compounds, thallium phosphate, coumarin derivatives), wood preservatives (chlorinated naphthalenes), insecticides (D.D.T., B.H.C.), pest control chemicals (E 605, DNC, DNOC, sodium chlorate, zinc carbamide), plasticizers (*o*-tricresyl phosphate), coal tar flooring compounds and "solid spirit fuel" tablets (polymerized acetaldehyde).—G. P. MARSHALL.

SCHÖBERL, A. (1956). Chemie und Toxikologie von Fabrikabgasen, Hüttenstaub und Hüttenrauch. **[Chemistry and toxicology of industrial fumes, fume deposits, vapours, dust and smoke.]**—*Mh. VetMed.* **11,** Suppl. No. 2. pp. 648-652. **3711**

A general review, with definitions, of the different types of noxious agents which may adversely affect animals and man either by inhalation or by ingestion, after being emitted from various heavy industrial establishments (*e.g.* metallurgical, chemical, glass, ceramic, cement and fertilizer works) in the form of gases, smoke, aerosol or dust, with particular emphasis on metal oxides and selenium and fluorine compounds.—G. P. MARSHALL.

COHRS, P. (1956). Erkrankungen der Haustiere durch Rauchschäden und Abwässer der Industrieanlagen. **[Diseases in domestic animals caused by industrial fumes and effluents.]**—*Mh. VetMed.* **11,** Suppl. No. 2. pp. 662-669. **3712**

C. reviewed the literature on the pathological changes produced in domestic animals by the various products involved in industrial atmospheric and aquatic pollution (airborne ash, arsenic, lead, iron, fluorine, copper, magnesium, molybdenum, selenium and zinc). He concluded that pneumoconiosis due to airborne ash is very rare in animals and that most frequently poisoning is due to lead, arsenic, sulphur dioxide and fluorine, particularly the last, which in the past 30 years has become the most important airborne toxic agent in this sphere.

—G. P. MARSHALL.

BERGMANN, E. D., MOSES, P. & NEEMAN, M. (1957). **Studies on organic compounds. VIII. *N*-Substituted fluoracetamides as insecticides and rodenticides.**—*J. Sci. Fd. Agric.* **8,** 400-404. [Abst. from authors' summary.] **3713**

N-Mono and *NN*-disubstituted fluoracetamides have been tested as potential larvicides, contact insecticides and rodenticides. All the monosubstituted amides were toxic to larvae of *Musca vicina* at a conc. of 100 p.p.m. Disubsituted amides were inactive or only slightly active. All these compounds were toxic to rats. The approx. LD_{50} values were lowest (4 to 8 mg./kg.) for *N*-mono-arylamides with small aryl radicals. Those with larger aryl substituents (α and β-naphthyl, *p*-diphenylyl and *p*-bromophenyl) had somewhat higher LD_{50} values. The possible mode of action of the toxicants is discussed.

BROCK, W. E., JONES, E. W., MACVICAR, R. & POPE, L. S. (1957). **Chlorinated naphthalene intoxication in sheep.**—*Amer. J. vet. Res.* **18,** 625-630. [Authors' summary modified.] **3714**

Experimental intoxication with highly chlorinated naphthalene revealed that sheep have a much greater tolerance than cattle, and do not show cutaneous hyperkeratosis or an excessive fall in the vitamin A content of the plasma. Nasal discharge, weakness, loss of weight, inappetence and ascites were observed. The P.M. findings were those associated with cardiovascular injury, necrosis and cirrhosis of the liver, and damage to the nephrons.

ROSE, A. L., GARDNER, C. A., MCCONNELL, J. D. & BULL, L. B. (1957). **Field and experimental investigation of "walk-about" disease of horses (Kimberley horse disease) in Northern Australia : *Crotalaria* poisoning in horses. Parts I & II.**—*Aust. vet. J.* **33,** 25-33. & 49-62. **3715**

I & II. Kimberley horse disease in northern Australia has for many years been the subject of intermittent investigation. These two

papers record research carried out in the period 1949–55. *Crotalaria retusa,* native to Australia, has been incriminated as the cause. It is an annual, grows to a height of 36 inches and when young is palatable to horses. It is closely related to *C. servicea* referred to in the American literature as *C. spectabilis. C. retusa* grows principally on low lying areas of the main river systems which flood periodically. In these areas the natural disease occurs. The clinical disease was reproduced in feeding trials and these constitute the only record of the feeding of *C. retusa* to horses. *C. novae-hollandiae* was also shown to be toxic to equines, but *C. trifoliastrum* was not toxic. In natural and experimental cases the pathology of the disease is identical with that of poisoning due to *Senecio* sp. and other plants containing pyrrolizidine alkaloids. In the acute disease centrilobular liver necrosis and haemorrhagic extravasations are found. Subacute and chronic cases show great enlargement of liver cells (megalocytosis) and some increase in fibrous tissue. The disease is distinct from those due to other poisonous plants studied in this area, viz., *Atalaya hemiglauca* and *Indigofera enneaphylla.*
—K. G. JOHNSTON.

HELLSTRÖM, N. (1956). **On the β-acetylacrylic acid and ester thereof and their action upon mice.**—*Kgl. Lantbrukshögsk. Ann.* **22,** pp. 297-316. [In English.] **3716**

Svandberg & Åberg suggested a relationship between the ingestion of *Ranunculus* spp. and lymphadenosis in cattle [*V.B.* **26,** 1693]. The present author studied the action on mice of a component of protoanemonin, which occurs in *Ranunculus*. There was no clear evidence that this substance caused leucocytosis in mice.
—R.M.

GHELARDONI, E. (1956). L'impiego dei semi di *Vicia ervilia* per provarne la tossicità in alcune specie domestiche. [**Study of the toxicity of *Vicia ervilia* seeds for domestic animals.**]—*Ann. Fac. Med. vet. Pisa* **9,** 123-142. [English and French summaries.] **3717**

Tests on lab. animals and fowls, donkeys and pigs revealed that the seeds are non-toxic.
—T.E.G.R.

WORKER, N. A. (1957). **A note on the detoxication of cyanide in ruminants.**—*N.Z. J. Sci. Tech.* **38,** 709. **3718**

In a survey of the serum thiocyanate values of Jersey milking cows the content of high-HCN clover in the diet (which varied from a minimum of 17% to a maximum of 70%) was without effect on the level of thiocyanate present, the figure remaining constant at 2–3 mg./100 ml. plasma throughout. This result is somewhat surprising in view of the fact that bovine liver has been shown to contain quite appreciable amounts of rhodanese. While the difference may in part be explained by a more efficient urinary excretion of thiocyanate in the cow than in the sheep, it is quite possible that in the cow an alternative mechanism is present for detoxicating ingested cyanide. The matter is being further investigated.

See also absts. **3785-3786** (reports, Southern Rhodesia).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

VELDSTRA, H. (1956). **Synergism and potentiation : with special reference to the combination of structural analogues.**—*Pharmacol. Rev.* **8,** 339-387. **3719**

A detailed discussion with reference to insecticides, analgesics, narcotics, chemotherapeutic agents (including antibiotics and antimetabolites), vitamins and hormones.—R.M.

SAEKI, Y. & KATSURAGI, T. (1955). [**Effects of some chemical substances on malformation of chick embryos and on hatchability.**]—*Bull. nat. Inst. agric. Sci. Japan* Ser. G. No. 11. pp. 39-46. [In Japanese. English summary.] **3720**

The authors injected various chemical substances into 874 fertile eggs. These were examined at the end of the first and second week of incubation. Highest incidence of malformations was caused by picric acid, boric acid and nicotinamide. Abnormalities were mostly of the face and limbs. Hatchability was markedly reduced, even when distilled water was injected.
—E.G.

SELYE, H. (1957). **The effect of phenylbutazone upon dihydrotachysterol overdosage in the rat.** — *Brit. J. Pharmacol.* **12,** 257-259. [Author's summary copied *verbatim.*] **3721**

Experiments on albino rats showed that short-term over-dosage with dihydrotachysterol, in amounts causing only traces of soft-tissue calcification, induced a very pronounced calcium deposition in the heart, aorta, and kidney when the animals were simultaneously treated with phenylbutazone. Special attention is called to

the fact that, under these experimental conditions, it is possible to obtain consistently a massive calcium deposition in the stroma of the renal papilla similar to that seen in "Randall's plaques" during the development of urolithiasis in man.

LUTSENKO, L. A. (1956). **[Blood transfusion and blood groups in reindeer.]** — *Trud. nauchno-issled. Inst. sel'sk. Khoz. krainego Severa* **3,** 136-145. [In Russian.] **3722**

L. stated that 4 out of 20 reindeer belonged to blood group O; 6 to group A; 1 to group B; and 7 to group AB. Blood transfusion under conditions prevailing in the tundra was described.—R.M.

DE LESTRANGE, BOYER, F., GRUMBACH & JACOB, J. (1956). Étude expérimentale de deux nouveaux dérivés alcoylaminés de la DDS. Comparaison avec leurs homologues inférieurs. **[A study of two dapsone derivatives.]**—*Bull. Soc. Pat. exot.* **49,** 1127-1138. **3723**

Two new alkyl derivatives of dapsone, viz. 4,4'-di(isopropylamino)-diphenylsulphone (3460 CT) and 4-amino-4'-isopropylamino-diphenylsulphone (3461 CT), as well as their diethyl (3198 CT) and monoethyl (3459 CT) homologues protected mice to some extent against infections with haemolytic Group A streptococci, pneumococci and *Mycobact. tuberculosis* (H_{37} Rv strain). The two monosubstituted derivatives (3461 CT and 3459 CT) proved more effective and less toxic than dapsone. *In vitro,* however, they were less effective than dapsone against *Proteus vulgaris, E. coli* and *M. tuberculosis,* while the other two derivatives (3460 CT and 3198 CT) were ineffective. All four compounds were tolerated in high dosage by rats, rabbits and dogs. Absorption studies showed them to be present for 48–72 hours in the blood of rats and mice, after a single dose (compared with 24 hours for dapsone). While resistant to hydrolysis *in vitro,* they were said to act by slow release of dapsone *in vivo,* while not excluding the possibility that the mono-alkyl derivatives may to some extent also act *per se.*—G. P. MARSHALL.

CRAVERI, R. & GIOLITTI, G. (1957). **An antibiotic with fungicidal and insecticidal activity produced by** *Streptomyces.*—*Nature, Lond.* **179,** 1307. **3724**

A yellow crystalline substance, designated "flavensomycin," isolated from a strain of the *Streptomyces tamaschiensis* type, was active against yeasts, filamentous fungi and insects. Against *Musca domestica* it had an activity 10 times greater than D.D.T.—E. G. WHITE.

FASTIER, F. N., SPEDEN, R. N. & WAAL, H. (1957). **Prolongation of chloral hydrate sleeping time by 5-hydroxytryptamine and by certain other drugs.**—*Brit. J. Pharmacol.* **12,** 251-256. [Authors' summary modified.] **3725**

Various drugs were tested for a capacity to prolong the hypnotic effect of chloral hydrate in mice. Amongst the compounds which, when injected s/c in substantial amount shortly before the chloral hydrate (250 mg./kg. i/p), increased sleeping time significantly were adrenaline, noradrenaline, phenylephrine, methoxamine, 5-hydroxy-tryptamine (serotonin), histamine, ergotamine, yohimbine, and atropine. This effect of these drugs could not be related to any common circulatory property, but most of the active drugs are known to lower the body temp. under comparable conditions. Mice which had been pre-treated with 5-hydroxytryptamine or adrenaline had a much greater fall of body temp. when chloral hydrate was given subsequently than mice given chloral hydrate alone. It is suggested that some, at least, of the drugs which prolong the effects of hypnotics do so by virtue of a hypothermic action.

See also absts. **3481** (effect of cortisone on TB. in mice); **3528** (antileptospiral action of tropolone compounds); **3536** (cetrimide tincture); **3545** (resistance of A. bovis to antibiotics); **3552** (sensitivity to antibiotics of PPLO); **3557** (pyraldin in surra); **3563** (effect of an antibiotic on secondary bacterial septicaemia in coccidiosis); **3564** (nicarbazin); **3565** (aminoacriquine); **3568-3569** (toxoplasmosis); **3584** ("anthiomaline" in bovine papillomatosis); **3617-3618 & 3621** (insecticides); **3627, 3630-3632, 3635-3636, 3639-3640 & 3642** (anthelmintics); **3739-3743** (antibiotics for preservation of meat); **3766** (antihistamine treatment of puerperal polyarthritis and tendovaginitis in cows); **3795** (British national formulary, 1957).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

HELLMANN, K. & COLLINS, K. J. (1957). **Thyroid, salivary and Harderian glands in mice exposed to heat.**—*J. Endocrin.* **15,** 145-150. [Authors' summary slightly modified.] **3726**

A reduction in the uptake of ^{131}I by the thyroid gland has been measured in mice reared in a hot environment (91 ± 1°F dry bulb, 85 ± 1°F wet bulb). Rapid concentration of ^{131}I occurs in the submaxillary glands following its intraperitoneal injection. Two and three-quarter hr. after injection the submaxillary glands from heat-exposed mice had a higher ^{131}I content than those from control counterparts. The inverse relationship between uptake of ^{131}I by thyroid and salivary glands in heat-exposed and control mice is probably due to partition of the injected

iodide between the tissues. A significant decrease in the weight of the Harderian glands, allowing for small decreases in body weight, was found in the mice reared in the hot environment.

STEPHENSON, S. K. (1957). **Wool follicle development in the New Zealand Romney and N-type sheep. I. The relationships of development to age in the New Zealand Romney and N-type sheep foetuses and a comparison with results obtained from the Merino.**—*Aust. J. agric. Res.* **8,** 371-384. **3727**

The development of wool follicles in New Zealand Romney and N-type sheep foetuses, ranging in age from 45 to 126 days, is described using a series of stages, based on those of Carter and Hardy [*V.B.* **20,** 476] and Hardy & Lyne [*V.B.* **27,** 258]. The rate of development of the follicle population and the ages at which different stages of follicle development are completed are similar in the N-type and New Zealand Romney, and in the Merino (data from Carter & Hardy). In agreement with the findings of other workers it is found that follicle development begins first on the head and limbs and later on the trunk.—A. G. LYNE.

CHIVILCHEZ CHÁVEZ, J. (1956). Estudio biométrico y structural de la lana de los auquénidos. (Alpaca, llama y vicuña.) [**Biometrical and structural study of the wool of alpacas, llamas and vicunas.**]—*Rev. Patronata Biol. anim., Madrid* **2,** 355-421. **3728**

A detailed account, with 42 photomicrographs.—R.M.

CARAVAGLIOS, R. & CILOTTI, R. (1957). **A study of the proteins in the follicular fluid of the cow.**—*J. Endocrin.* **15,** 273-278. [Authors' summary modified.] **3729**

Paper electrophoresis showed that the protein components were qualitatively similar to those of blood serum, although there were some quantitative differences. Thus albumin levels are greater in follicular fluid than in serum, while α_2- and γ_2-globulins are lower in the former. β-Lipoproteins are not detectable in the follicular fluid. The ratio between total proteins and some glycoproteins is similar in both fluids. The significance of these results in relation to the origin of the follicular fluid is discussed.

TAYLOR, L. W., SJODIN, R. A. & GUNNS, C. A. (1956). **The gaseous environment of the chick embryo in relation to its development and hatchability. I. Effect of carbon dioxide and oxygen levels during the first four days of incubation upon hatchability.**—*Poult. Sci.* **35,** 1206-1215. **3730**

Hatchability was normal when incubating eggs were exposed for the first 4 days to CO_2 levels from 0–1%, but at concentrations above 1·1%, hatchability was significantly reduced in direct proportion to the increase in CO_2 levels, 10% being the extinction point. No level of CO_2 consistently produced a significantly better hatchability than in the control incubators operating at 0·05–0·12% CO_2. Oxygen levels below 18% and above 75% reduced hatchability significantly, but the extinction point of embryonic survival was reached only at 99% O_2 level. Commercial incubators tested had O_2 and CO_2 levels well within the range of tolerance of early chick embryos for optimal hatching.

—A. ACKROYD.

BARRON, D. H. & MESCHIA, G. (1957). **The carbon dioxide concentration gradient between the fetal and maternal bloods of sheep and goats.**—*Yale J. Biol. Med.* **29,** 480-495. [Authors' summary modified.] **3731**

The concentrations of the dissolved CO_2, the bicarbonate and hydrogen ion in the plasma drawn from each of the four principal vessels serving the placenta of the sheep and goat—*i.e.*, the uterine artery, uterine vein, umbilical artery, umbilical vein—were determined at various stages of gestation. The concentration of the dissolved CO_2 on the foetal side of the placental barrier was about 0·24 millimols per litre higher during the last month of pregnancy.

During the same period the bicarbonate concentrations of the foetal plasma ranged from −0·17 to +7·9 mM/litre and its pH from −0·11 to +0·08 of a unit with respect to the corresponding values in the related maternal uterine vessels. This variability is probably due to the circumstance that a sampling of the maternal and foetal bloods in a steady state is rarely achieved. What the bicarbonate and pH values of the foetal plasma in relation to the maternal are in the steady state is discussed.

On the basis of these findings the authors speculated concerning the physical properties of the placental barrier.

LEWIS, D., HILL, K. J. & ANNISON, E. F. (1957). **Studies on the portal blood of sheep. I. Absorption of ammonia from the rumen of the sheep.**—*Biochem. J.* **66,** 587-592. **3732**

ANNISON, E. F., HILL, K. J. & LEWIS, D. (1957). **Studies on the portal blood of sheep. II. Absorption of volatile fatty acids from the rumen of the sheep.**—*Ibid.* 592-599. [Authors' summaries copied *verbatim.*] **3733**

I. A technique is described for taking

repeated samples of portal blood in the sheep. Changes in the rumen-ammonia concentration of sheep fed on various diets were paralleled by changes in portal-blood ammonia concentration. At the maximum rumen-ammonia level attained as a result of feeding (60 m-moles/l.), an increase in ammonia concentration was not detected in peripheral blood. When this concentration was exceeded by adding ammonium acetate solution to the rumen, ammonia was present in peripheral blood. As the concentration of ammonia in peripheral blood exceeded 0·6–0·9 m-mole/l. toxic symptoms developed.

II. A study was made of the changes in the concentrations of the individual volatile fatty acids present in the rumen, and portal and peripheral blood, of sheep fed on diets of hay, hay and casein, and of alkali-washed straw and starch. Considerable amounts of volatile fatty acids were absorbed from the rumen, and there was good correlation between the concentrations of total volatile fatty acids in portal blood and rumen contents. Under normal feeding conditions there is a much lower concentration of butyrate, relative to the levels of acetate and propionate, in the portal system than in rumen contents. Concentrations of ketone bodies in the portal vein usually exceeded those in the peripheral blood. Only minor differences in portal and peripheral blood glucose were detected. The absorption of the individual acids, acetic, propionic and butyric, from the rumen into the portal system was demonstated, and the corresponding levels in peripheral blood were examined. Dosage with butyrate resulted initially in high ketone-body levels in portal blood, followed by a steady rise of concentration in peripheral blood.

CHI-CHIN LIANG. (1957). **The formation of complexes between haemoglobins and plasma proteins in a variety of animals.**—*Biochem. J.* **66**, 552-558. [Author's summary slightly modified.] **3734**

The formation of complexes between partially denatured ferrous and ferric haemoglobins and plasma proteins of a variety of vertebrate animals was studied by immersed-paper electrophoresis and visible and ultra-violet spectrophotometry. Haemoglobin, irrespective of its origin, forms complexes with α_2-globulin of horse, dog, pig and duck plasma; with fibrinogen of ox plasma; with albumin of turtle plasma; and with α_2-globulin and albumin of human and frog plasma. No such complexes are formed with the plasma proteins of goat, rabbit or g. pig. These complexes are not haemochromogens but may be partially denatured haemoglobins bound by the prosthetic group to specific plasma proteins which act as vehicles.

SWANSON, E. W., MONROE, R. A., ZILVERSMIT, D. B., VISEK, W. J. & COMAR, C. L. (1956). **A study of variations in secretion of Ca^{45} by the mammary glands of dairy cows.**—*J. Dairy Sci.* **39**, 1594-1608. **3735**

Two lactating cows were given Ca^{45} i/v. There was a delay of about 8 hours between the peak of activity in the blood and that in the milk. This delay of 8 hours persisted as the activity in both materials declined. The existence of a calcium reservoir in the udder is suggested, from which a large proportion of the milk Ca is eventually drawn. There were variations in response, however, after oral administration of Ca^{45}, revealing that individual cows absorb and metabolize ingested Ca at different rates. In one cow the peak of activity in the milk exceeded that in the blood, in another it was lower than that in the blood. The lag between declining blood activity and milk activity varied also. An explanation for the excessive rise in milk Ca^{45} content was not found. The hypothesis that the udder preferentially selects Ca^{45} from the blood was not supported by paper electrophoresis of blood and milk, arterial-venous differences, results of i/v injection of stable Ca every 30 min. for 8 hours, and determination of 6 stable isotopes of Ca in blood and milk.—M.G.G.

HELLSTRÖM, N. (1956). **A study in digestion. I. Analyses of feces from sheep.** — *Kgl. Lantbrukshögsk. Ann.* **22**, pp. 9-16. [In Russian.] **3736**

When the procedure for obtaining a comparatively nitrogen-free product from hay was applied to faeces from sheep, the product obtained still contained about 50% of the Kjeldahl nitrogen present in the original dry faeces. This could not be explained as an interference of the additional feed and drew attention to microbial nitrogen. Microscopic examination of the faeces revealed a weakly birefrigent yellowish gelatinous material intimately mixed with fibres which gave, with acridine orange NO, a red fluorescence in ultra-violet light. Fractionating the faeces mechanically according to the particle size may be advantageous for further development of research on digestion, using faeces. A method is described.

—A. ACKROYD.

KOLB, E. (1956). Zur Kenntnis des Stoffwechsels der Oxalsäure unter besonderer Berücksichtigung des mikrobiellen Abbaues. **[Metabolism**

of oxalic acid with special reference to bacterial breakdown.]—*Arch. exp. VetMed.* **10,** 535-576 & 661-687. **3737**

After extensive discussion of the subject, K. described *in vitro* experiments on the catabolism of oxalic acid in different parts of the ruminant digestive tract. The common intestinal bacteria did not break down oxalic acid, but 4 species of *Streptomyces* were found in hay and straw which did break down the acid. Destruction of the acid during production of silage from meadow grass, red clover and lucerne was confirmed; there was no decrease of acid in beet-leaf silage.—R.M.

DURHAM, W. F., CUETO, C., JR. & HAYES, W. J., JR. (1956). **Hormonal influences on DDT metabolism in the white rat.**—*Amer. J. Physiol.* **187,** 373-377. **3738**

Testosterone propionate (TP) increased the growth rate of female whilst diethylstilboestrol (DES) inhibited that of male rats. Both hormones and D.D.T. increased the liver weight/body weight ratio as compared with control animals especially in the males. DES increased the normally low level of storage of D.D.T. in the fat of males whilst TP decreased the normally high level of storage of D.D.T. in females, but normal females receiving TP still stored more D.D.T. in their fat than males receiving DES. Castration had similar though less marked effects, even in the hormone treated animals.

—A. ACKROYD.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

MCMAHAN, J. R., DOWNING, H. E., OTTKE, R. C., LUTHER, H. G. & WRENSHALL, C. L. (1956). **Antibiotic preservation of meats. I. Preliminary experiments with intraperitoneal injection of animals before slaughter.** In "Antibiotics Annual 1955/56". pp. 727-730. [New York: Medical Encyclopedia Inc.] **3739**

SACCHI, E. M., MCMAHAN, J. R., OTTKE, R. C. & KERSEY, R. C. (1956). **Antibiotic preservation of meats. II. Intraperitoneal injection of oxytetracycline in beef cattle.** *Ibid.* pp. 731-733. **3740**

DOWNING, H. E., HARDIE, W. B., MCMAHAN, J. R. & BILLMAN, D. C. (1956). **Antibiotic preservation of meats. III. Intraperitoneal injection of oxytetracycline in sheep.** *Ibid.* pp. 734-736. **3741**

DOWNING, H. E., MCMAHAN, J. R. & BAKER, C. (1956). **Antibiotic preservation of meats. IV. Intraperitoneal injection of oxytetracycline in hogs.** *Ibid.* pp. 737-738. **3742**

I—IV. The authors studied the keeping qualities of carcasses of animals which had been injected i/p with the hydrochloride or the quaternary ammonium complex of oxytetracycline, between 1 and 4 hours before slaughter. Dosages employed were about 3 mg./lb. body wt. for cattle, sheep and pigs. A conc. of oxytetracycline as low as 0·5 p.p.m. in muscle inhibited the growth of putrefactive bacteria; carcasses of treated animals could be kept at room temp. for up to 7 days without spoilage. An alternative method of treatment (used for sides of pork) was the spraying of carcasses with a mixture of 10 p.p.m. oxytetracycline in 0·5% carboxymethylcellulose with a wetting agent.

—R.M.

SHRIMPTON, D. H. (1957). **The use of chlortetracycline (aureomycin) to retard the spoilage of poultry carcasses.**—*J. Sci. Fd Agric.* **8,** 485-489. [Abst. from author's summary.] **3743**

Chlortetracycline did not prolong significantly the short storage life of eviscerated poultry carcasses kept at ordinary temperatures.

HAMDY, M. K., DEATHERAGE, F. E. & SHINOWARA, G. Y. (1957). **Bruised tissue. I. Biochemical changes resulting from blunt injury.** — *Proc. Soc. exp. Biol., N.Y.* **95,** 255-258. [Authors' summary modified.] **3744**

In experimentally inflicted bruises of cattle, the greatest swelling and fluid volume occurred within 2 days. The maximum biochemical changes in bruised tissue were found on or about the 4th or 5th day: these included a drop in non-protein nitrogen to a quarter of the control level and a two-fold increase in the "easily split iron" concentration. A tenfold increase in red pigment was due to extra-stromal haemoglobin. Bilirubin formation in bruised tissue was demonstrated conclusively; the probable metabolic derivation of this pigment is discussed. Although healing was evident grossly in 7 days, the biochemical values did not return completely to the control levels until the 9th day.

ORLOP, H. (1956). Über Pigmentierungen von Nieren und Lymphknoten bei importierten dänischen Schlachttieren. [**Pigmentation of kidneys and lymph nodes in slaughter cattle, imported from Denmark.**]—*Arch. Lebensmittelhyg.* **7,** 255-261. **3745**

Of adult slaughter cattle imported from

Denmark between 1950 and 1955, 2·3% had dark brown discoloration in the cortex of the kidneys. The pigment was in the form of granules of varying sizes in the convoluted tubules, and to a lesser extent in the straight tubules. It had the morphological and chemical properties of lipofuchsin. Pigmentation of the medulla of the lymph nodes by lipofuchsin, particularly the mesenteric and renal lymph nodes, was an almost regular finding in Danish cattle. It did not appear to be connected with the discoloration of the kidneys. The phenomenon was also observed in the kidneys of Danish sows. [See also *V.B.* **23,** 1708.]—M.G.G.

See also absts. **3502** (contamination of fish meal with salmonella); **3606** (Q fever); **3791** (book, control of bovine TB.); **3794** (book, control of animal diseases); **3797** (text book of meat inspection).

REPRODUCTION AND REPRODUCTIVE DISORDERS

NISHIKAWA, Y., WAIDE, Y. & OTSUKI, K. (1955). **The improvement of egg yolk buffer solution for bull semen and the use of ampoule to keep it.**—*Bull. Nat. Inst. agric. Sci., Japan* Ser. G. No. 11. pp. 67-79. [In English.] **3746**

Details are given of "Seminam", a Japanese proprietary semen diluent, consisting of 25% egg yolk, 1·6% sodium citrate, 0·11% potassium citrate, 0·15% sodium phosphate, 0·9% glucose, 0·10% "Homosulfamine" and 0·05% "Sodium sulfamesadine". The diluent is sealed in ampoules ready for use.—E.G.

FARRELLY, B. T. (1957). **A rapid method for staining equine and bovine spermatozoa together with biophysical and histochemical considerations.**—*Irish vet. J.* **11,** 2-18. **3747**

F. stresses that the eosin-nigrosin method may not be satisfactory for interpreting morphological normality of live spermatozoa. His method involves fixation in 10% formol saline and short duration staining in soluble aniline blue, followed by crystal violet, each in 5% aqueous solution. Equine semen smears thus stained show the acrosome and equatorial zone, of which the existence in this species had previously been denied. The histochemical aspects of the reactions involved are discussed at length. —F. L. M. DAWSON.

SCHMIDT, K. & STEGER, H. (1957). Beziehungen zwischen Fruktolyse im Bullensperma und der Fruchtbarkeit beim Rind. [**Relationship between fructolysis in bull semen and fertility.**] — *Zuchthyg. FortpflStörung. u. Besamung.* **1,** 95-105. **3748**

146 ejaculates from 15 bulls were used (diluted 1:15 or 1:30) for 1,889 first inseminations. On a basis of non-returns at 4 months, and using Mann's fructolysis index, statistical analysis indicated a positive correlation between fructolysis and fertility, the index rising from 1·75 to 4·0 as conception rate rose from 63 to 75%.—F. L. M. DAWSON.

VANDEMARK, N. L. & SHARMA, U. D. (1956). **A preliminary report on preservation of bovine semen at room temperature.**—*J. Anim. Sci.* **13,** 1212. **3749**

Semen diluted 1:10 and stored at 21° to 33°C. remained alive for 10–15 days if the supernatant fluid in each storage tube was removed and replaced by fresh diluent daily. Semen in untreated tubes remained alive for 4–6 days under the same conditions.—R.M.

BRETSCHNEIDER, L. H. (1955). Die Morphogenese und Pathogenese der Spermien vom Stier. I. II. [**Morphology and pathology of bull spermatozoa. I. II.**]—*Proc. Acad. Sci. Amst.* Ser. C. **58,** 495-508 & 509-522. [In German. English summary.] **3750**

I. & II. B. concluded from an electron-microscopic study of normal and abnormal bull spermatozoa that component parts of the spermatozoon may develop either hypoplastically or hyperplastically. Parts may develop either normally or abnormally, quite independently of other components in the same spermatozoon. There may be retardation of differentiation of certain parts and development may even stop altogether at any of the developmental stages. Abnormal forms may also result from numerical increase of certain components.—E.G.

GRAÇA ARAUJO, P. (1955). Verificação da fertilidade do sêmen congelado de carneiro, conservado a −79°C. [**Fertilizing capacity of ram semen stored at −79°C.**] — *Bol. Insem. art.* **7,** 5-10. [In Portuguese. English and French summaries.] **3751**

Of 176 ewes each inseminated twice with 0·2 ml. of semen stored for 45 days at −79°C., conception probably occurred in 55. Two dilutions of semen (1:5 and 1:10) were used. —R.M.

MOULTRIE, F. (1956). **A new technique for the artificial insemination of caged hens.**—*Poult. Sci.* **35,** 1230-1234. **3752**

The technique permitted the rapid insemination of fowls kept in small laying cages, with-

out removing the fowl from the cage; it was a modification of the technique described by Quinn & Burrows (1936).—R.M.

COOPER, D. M. & ROWELL, J. G. (1957). **Laboratory prediction of the fertilizing capacity of cock semen.**—*Poult. Sci.* **36,** 284-285. **3753**

The following tests were applied to semen from 24 cockerels: initial motility, initial pH, percentage of dead spermatozoa in stained smears, spermatozoa density, resazurin reduction. All except the last two methods were of potential value for determining the fertilizing capacity of a cockerel.—R.M.

HERRICK, R. B. & ADAMS, J. L. (1956). **The effects of progesterone and diethylstilbestrol injected singly or in combination on sexual libido and the weight of the testes of single White Leghorn cockerels.**—*Poult. Sci.* **35,** 1269-1273. [Abst. from authors' summary.] **3754**

Progesterone depressed testicle weight and mating behaviour. Diethylstilboestrol depressed testicle weight, but did not affect mating behaviour. A combination of the two hormones depressed testicle weight more than either hormone alone, but did not depress mating behaviour. The number of spermatozoa was reduced by progesterone treatment. No spermatozoa were observed in any cockerels treated with diethylstilboestrol alone or combined with progesterone.

BENSON, G. K., COWIE, A. T., COX, C. P. & GOLDZVEIG, S. A. (1957). **Effects of oestrone and progesterone on mammary development in the guinea-pig.**—*J. Endocrin.* **15,** 126-144. [Abst. from authors' summary.] **3755**

The observation made by previous workers that complete mammary development could be evoked in the g. pig by oestrogen alone was not confirmed. Over a wide dose range of oestrone better development of the gland was obtained if progesterone was also administered. With some dosages of oestrone the synergic effects of progesterone were very pronounced. Maximal mammary development was observed with a daily dose of 10–50 μg. oestrone in combination with 1000 μg. progesterone. Considerable lobule-alveolar development was observed with progesterone alone when the daily dose was sufficiently high (2400 μg.). No histological abnormalities were observed in the glands except in those developed on the lowest dose of oestrone to give significant growth effects (0·1 μg.), in which there was some evidence of cystic changes.

CAMPBELL, J. G. (1957). **Studies on the influence of sex hormones on the avian liver. I. Sexual differences in avian liver clearance curves. II. Acute liver damage in the male fowl, and the protective effect of oestrogen, as determined by a liver function test. III. Oestrogen-induced regeneration of the chronically damaged liver.**—*J. Endocrin.* **15,** 339-345; 346-350 & 351-354. [Author's summaries copied *verbatim.*] **3756**

I. A modified method of determining the avian liver clearance of intravenously administered sodium bromosulphthalein (BSP) is described. Using this test, a sexual difference has been observed in the clearance gradients over the periods 5–10 and 10–15 min. after injection of BSP. This appears to be determined by sex hormones, in that males caponized by stilboestrol possess a female type of clearance. Surgically caponized birds appear to occupy an anomalous position which can be variously interpreted as showing female or male trends, according to the particular clearance gradients selected. Androgen, however, causes a clear reversion to the male type of excretion. High initial BSP concentrations in the plasma of certain females have been correlated with a relatively smaller blood volume in proportion to body weight increase.

II. Liver function in male fowls as assessed by a modified sodium bromosulphthalein clearance test, is noticeably impaired 1–1½ hr. after a sublethal dose of the hepatotoxic alkaloid, seneciphylline, and is greatly impaired at 4–4½ hr. Between this period and 24 hr. the clearance curve returns to more normal values, but is now of the female type, and this alteration in the mode of excretion of the dye persists for at least 5 days after a single administration of the alkaloid. Previous treatment with diethylstilboestrol protects the male bird's liver to a considerable degree against the hepatotoxic effect of the alkaloid. On the evidence of liver clearance curves, male birds receiving repeated weekly sublethal doses of seneciphylline return to normal much more quickly if previously treated with stilboestrol than control birds not so treated; they also gain weight at a faster rate. It is suggested that within reasonable limits of liver damage, the accumulation of oestrogen, through the inability of the liver to excrete it and its retention in inflamed cells, may be beneficial in that it helps to protect against further damage, and also may encourage repair processes.

III. In the male fowl spontaneous repair of the liver, damaged by repeated doses of the

alkaloids of *Senecio jacobaea* L., takes place extremely slowly, if at all. Females subjected to the same treatment tend to recover. In both sexes, but particularly in the male, massive doses of stilboestrol continuously absorbed from pellet implants initiate and speed up liver regeneration. The hypothesis is advanced that the impaired ability of the damaged liver to conjugate and inactivate oestrogen is advantageous in so far as the raised oestrogen level stimulates repair processes in that organ.

ZIMMERMANN, W. (1956). Infektionsresistenz in endokrinologischer Sicht. Die 17-Ketosteroidausscheidung als ihr Gradmesser? [**The endocrinological aspect of resistance to infection. Excretion of 17-ketosteroids as an index of resistance.**]—*Zbl. Bakt. I. (Orig.)* **167,** 140-169. [English, French and Russian summaries.] **3757**

A close correlation is found between the excretion of 17-ketosteroids, the properdin content of the blood, and resistance to infection. There is often a fall in excretion of 17-ketosteroids during the incubation period of an infection. It is therefore concluded that the steroid hormones, which are catabolized to 17-ketosteroids and excreted, play an important role in resistance.—M.G.G.

I. CONRADI, H. (1957). Über chronische Hodenveränderungen bei Zuchtbullen und ihre klinische Feststellung. [**Chronic testicular lesions in bulls and their clinical diagnosis.**]—*Zuchthyg. FortpflStörung. u. Besamung* **1,** 65-76. **3758**

II. FISCHER, W. (1957). Histologische Untersuchungen bei ätiologisch unklaren Hodenveränderungen von Bullen. [**Histological study of aetiologically obscure testicular lesions in bulls.**]—*Ibid.* 77-85. **3759**

I. 32 infertile bulls, were encountered during 12 months. In 10 of 24 from which testicular sections were studied, the appearances, with fibrosis and calcification, strongly suggested TB., which is not, however, considered to be the probable explanation. The remainder showed a simple atrophy of the germinal epithelium. Clinical symptoms were slight; libido was commonly increased. Conradi considers testicular consistency usefully significant.

II. F. elaborated the evidence against a tuberculous origin for the lesions in the above material, and eliminated other likely bacterial causes. The only suggestions made as to the cause were the possibility of nutritional disturbances, and overwork on young bulls.

—F. L. M. DAWSON.

KRAFFT, H. (1957). Zur Behandlung der Nymphomanie der Kühe durch Implantation von Kalbshypophysen. [**Treatment of nymphomania in cows by implantation of calf pituitary.**]—*Mh. VetMed.* **12,** 211-212. **3760**

Pituitaries from freshly slaughtered unweaned calves were implanted between the oblique abdominal muscles of 4 moderate cases of nymphomania, which had failed to respond to rupture of follicles and/or chorionic gonadotrophins. Conception occurred in 3 of these within 10 weeks. [In abstractor's experience similar recoveries often ensue through the lapse of time.]—F. L. M. DAWSON.

AUSTIN, C. R. & BISHOP, M. W. H. (1957). **Fertilization in mammals.**—*Biol. Rev.* **32,** 296-349. **3761**

A very comprehensive review incorporating about 240 references. It includes a section on alternatives to normal fertilization, and one of special interest on experimental manipulation of gametes.—F. L. M. DAWSON.

PETERS, H. F. & NEWBOUND, K. B. (1957). **Intra-testicular temperature and fertility of bison, Cattalo, and Hereford yearling bulls.** —*Canad. J. anim. Sci.* **37,** 14-20. **3762**

Intra-testicular temperatures of seven bison, eleven Hereford and eleven "cattalo" yearling bulls were measured by a thermocouple. Mean temperatures were: bison $93{\cdot}9 \pm 4{\cdot}0$°F., Hereford $91{\cdot}0 \pm 3{\cdot}7$°F. and "cattalo" $86{\cdot}8 \pm 5{\cdot}5$°F.

Mean testis weights in grams were—bison $53{\cdot}3 \pm 6{\cdot}8$, Hereford $201{\cdot}3 \pm 12{\cdot}9$, "cattalo" $89{\cdot}9 \pm 26{\cdot}2$. These differences were significant at the 1 per cent level of probability.

Fertility estimates by examination of semen smears taken from the tail of the epididymis were obtained on four bison, four Herefords and eleven "cattalos". No spermatozoa were present in the bison and seven of the "cattalo" samples; Three "cattalos" showed a few spermatozoa, one "cattalo" and all the Herefords showed good spermatozoa concentration. The yearling bison bulls may have been sexually immature.—D. MITCHELL.

LENSCH, J. (1957). **Physiological and pathological ovulation in mares.**—*Irish vet. J.* **11,** 22-29. **3763**

In the course of 4 years L. controlled breeding operations involving 972 mares at one centre. He considers that follicles migrate towards the ovulation fossa as they ripen. Case histories are efficiently recorded by schematic diagrams well correlating signs of oestrus with ovarian contents (as determined by palpation).

Ovulation delayed to 3 days after cessation of signs of oestrus has been observed, and repeated artificial insemination at short intervals sometimes results in pregnancy.

Cystic ovarian disease is common and the prognosis is worse in older mares; young spring grass appeared to be almost a specific. Hormone treatment failed. Anoestrus affected 5% of subjects studied, including aged and juvenile subjects and mares in hard training.

—F. L. M. DAWSON.

HART, D. S. (1956). **Sources of loss in the unfertilised and fertilised sheep's ova.**—*Proc. N. Z. Soc. Anim. Prod.* **16,** pp. 101-112. Discussion: pp. 113-114. **3764**

The authors studied over 1,000 ova recovered (by flushing the uterus and the oviducts with normal saline or homologous serum at 37°C.) from the genital organs of 866 ewes slaughtered during 6 breeding seasons. The ewes had been run with ochred rams and records of their breeding behaviour were studied in conjunction with the study of the ova. A fertilized and therefore normal ovum was always identifiable by surplus spermatozoa embedded in the zona pellucida, as well as by nuclear changes. Abnormal ova comprised 17·3% of 220 studied in 1955; a majority "involuted", and others sharply distinguishable as "vacuolated". Vacuolation was also observed in some fertilized ova, causing embryonic death. These results withstood criticism in discussion on the paper.

—F. L. M. DAWSON.

MIES FILHO, A. & DIAS COSTA AROEIRA, J. A. (1955). O intervalo parto-primeiro cio no gado zebu leiteiro de Uberaba. [**Interval between parturition and oestrus in zebu cattle in Brazil.**]—*Bol. Insem. art.* **7,** 11-17. [In Portuguese. English and French summaries and conclusions.] **3765**

The interval averaged 87 days. Methods for shortening it were discussed.—R.M.

GLÄTTLI, H. (1957). Versuche mit dem Antiallergicum Antistin Ciba bei der Behandlung der puerperalen Polyarthritis und Tendovaginitis (Sapraemie oder Toxaemie) des Rindes. [**Treatment of puerperal polyarthritis and tendovaginitis in cattle with an antihistamine.**]—*Tierärztl. Umsch.* **12,** 155-158. **3766**

Good results were claimed for the treatment of puerperal polyarthritis and tendovaginitis in 5 cows with "Antistin" (antazoline). A single dose of 40–50 ml. was injected i/v, together with a proprietary calcium preparation.

—G. P. MARSHALL.

THOONEN, J. & HOORENS, J. (1956). Epitheliogenesis imperfecta neonatorum bij het varken. [**Epitheliogenesis imperfecta neonatorum in the pig.**]—*Vlaam. diergeneesk. Tijdschr.* **25,** 239-243. [In Flemish. French summary.] **3767**

Report of a case, with histological findings.

—R.M.

STOTT, D. H. (1957). **Physical and mental handicaps following a disturbed pregnancy.**—*Lancet* **272,** 1006-1012. **3768**

Of 102 mentally retarded children, 67 had been born after a pregnancy disturbed by illness and/or mental stress, 15 had congenital malformations, and 56 suffered from non-infectious diseases in the first 3 years of life which were not due to neglect. In a control group of 450 children, 173 of them siblings of mentally handicapped children, only 135 (30%) were born after a disturbed pregnancy, 7 were congenitally malformed and 81 (18%) were in poor health during infancy. Of the 22 cases of malformation, 18 were associated with disturbed pregnancy.

—M.G.G.

SCHUMANN, H. (1957). Letales Grau beim Schaf. [**Lethal grey in sheep.**]—*Schweiz. Arch. Tierheilk.* **99,** 27-32. [English, French and Italian summaries.] **3769**

Because of the linkage of a lethal factor with the colour factor, heterozygotes being viable but homozygotes dying before or after birth, it has not proved possible to produce a pure breed of grey Karakul sheep in countries like Russia and Roumania where the grey ones are of especial value.—H. SCOTT MCTAGGART.

BLAIZOT, L., RAYNAUD, A., RAYNAUD, A. (MME), BOULAY, P. & BLIN, P. -C. (1957). Sur un cas d'otognathie chez le mouton. Etude histologique des formations tératologiques surnuméraires. [**Otognathia in a sheep. Histological study of the supernumerary parts.**]—*Rec. Méd. vét.* **133,** 69-90. **3770**

An account of a case in a 2-month-old male lamb. At the base of the left ear was a supernumery lower jaw and at the base of the right ear a structure probably representing a deformed rudimentary lower jaw. The histology of these structures is described and various hypotheses concerning their morphogenesis are discussed. The authors consider it most likely that otognathia results from a duplication of the primordium of the mandibular process brought about by the action of a chemical substance within the foetus.—H. SCOTT MCTAGGART.

See also absts. **3496** (S. dublin abortion in ewes); **3509, 3513-3524** (brucellosis); **3535** (infertility and abortion in sheep and goats); **3554** (bacteriology of fowl semen).

ZOOTECHNY

HYLAND, P. (1956). **Fleece measurement in practice : a scientific aid to selection.** — *J. Dep. Agric., Vict.* **54,** 551-562. **3771**

The application of fleece measurement as an aid to selection of sheep is discussed. Practical methods of organizing the shearing shed and of recording necessary measurements are suggested, and selection procedure for both the studs and the commercial flocks are outlined.

—S. S. Y. YOUNG.

I SCHINCKEL, P. G. (1956). **Fleece measurement and flock improvement.**—*Aust. vet. J.* **32,** 274-277. **3772**

II. MILLER, S. J. & MOULE, G. R. (1956). **Fleece measurement and flock improvement.** —*Ibid.* 278-285. **3773**

I. The characters of Merino sheep and wool to be considered in a selection programme were discussed. A system of selection, based on a "half classing" method, first proposed by Morley (1955) [*Agric. Gaz. N.S.W.* **66,** 526-531], and combining subjective and objective assessments of these characters, was suggested. Using this system, rams are first examined when 12 to 15 months of age on the basis of visual merit and 10–20% are selected. Final selection of stud rams is based mainly on measurements.

II. The organization of the sheep breeding industry and the facilities available for fleece measurement in Queensland are outlined. Data obtained from the studs and experimental stations are discussed; they have shown that only small selection differentials of wool weight can be achieved through ewe selection of rams, owing to differences in selection intensities. Using the accepted levels of heritability and selection differentials, the genetic gains per year were calculated and their importance stressed. The practice of fleece measurement and of some associated problems are discussed.—S. S. Y. YOUNG.

BEATTIE, A. W. (1956). **The relationship between greasy fleece weight and clean fleece weight and its application.**—*Qd. J. agric. Sci.* **13,** 221-228. **3774**

There was high correlation between greasy and clean fleece weights and moderate correlations between staple length and the fleece weights of samples from 6 fleeces of Merinos and from one flock of Corriedales. Scouring of greasy fleece samples as an aid to selection for high clean fleece weights was justified only at high selection intensities. A combination of culling for low greasy wool wt. and selection for high clean fleece wt. was an efficient method of selection.

—S. S. Y. YOUNG.

KITCHELL, R. L., AUNAN, W. J., MURPHY, L. W. & MOSSBERG, D. P. (1957). **Shackling as a factor in ham hip-joint hemorrhage.**—*Amer. J. vet. Res.* **18,** 491-501. [Authors' summary and conclusions modified.] **3775**

Studies in 4 pig abattoirs indicated that shackling causes most of the external hip-joint haemorrhages in hams, and that the insertion of a gambrel is largely responsible for the remainder. The use of a gambrel caused most of the internal hip-joint haemorrhages. The horizontal conveyor method of slaughtering pigs is recommended.

PRESTON, T. R. & GEE, I. (1957). **Effect of hexoestrol on carcass composition and efficiency of food utilization in fattening lambs.**—*Nature, Lond.* **179,** 247-249. **3776**

Thirty-six 5-month-old lambs were allocated to 3 groups; one group was slaughtered immediately, in the second each lamb received s/c a pellet of 15 mg. hexoestrol followed by another 50 days later, and the third group received no treatment. The treated lambs made bigger daily gains in weight and yielded heavier carcasses with more edible meat and more bone than the controls. The carcasses also had a thinner cover of fat and better muscular development, and the edible meat contained more protein and moisture but less fat than in the controls. The leg and "rest" joints were heavier but the loin lighter than in the controls. There was no significant difference in killing-out percentages. The treated lambs converted food more efficiently, and the conversion of food protein to meat protein was 31% more efficient than in the controls. On the other hand, the conversion of food to edible meat in terms of calories was slightly less than in the controls.—M.G.G.

COTSELL, J. C. & EDGAR, G. (1957). **The breeding and management of Merino sheep on the granitic soils of eastern New England, New South Wales.**—*Aust. vet. J.* **33,** 129-136. **3777**

An experimental comparison was made of four systems of managing breeding flocks of Merinos on a granitic soil area on the Northern Tablelands of New South Wales. Sheep were run (a) grazing full time at 3 sheep to 4 acres on native pasture consisting mainly of summer growing species; (b) grazing mainly on native

pasture during the summer but during the winter period (April—October) grazing half of each week on native pasture at 3 sheep to 4 acres, and the other half at 2 sheep per acre on sown pastures of introduced grasses and clovers. Each group was subdivided into a group lambing unshorn in September and a group lambing after shearing in November.

Four years' results showed that management of flocks full time on native pastures was disastrous, it being impossible to maintain flock numbers by natural increase. The percentages of lambs weaned in the Sept. and Nov. groups were 26 and 28 respectively. Growth rates in young ewes were so poor that they could not be satisfactorily mated at 19 months of age. On the other hand the improved pasture treatments, which were continued for an additional 5 years, both proved to be satisfactory systems of management in which considerable numbers of surplus stock were produced. The percentages of lambs weaned in the Sept. and Nov. improved pasture groups were 69 and 76 respectively. The wool production per acre was nearly 3 times as great as in the natural pasture groups. The groups lambing in Sept. gave the greater numbers of lambs born but higher death rates of both ewes and lambs.—A. A. DUNLOP.

TECHNIQUE AND APPARATUS

I. ANNEAR, D. I. (1956). **The preservation of bacteria by drying in peptone plugs.**—*J. Hyg., Camb.* **54,** 487-508. **3778**

II. ANNEAR, D. I. & BESWICK, T. S. L. (1956). **A note on the preservation of influenza virus.** —*Ibid.* 509-511. **3779**

I & II. The method consisted of dehydrating in a vacuum the viscous product which resulted when a small volume of bacterial suspension was incorporated in a plug of sterile freeze-dried peptone. It was suitable for organisms which were often killed by other methods of drying (*e.g. Vibrio cholerae*) and was also used for the drying of influenza virus. —R.M.

EDWARDS, B. L. (1956). **A simple method for the examination of blood samples by the estimation of specific gravity.**—*Vet. Rec.* **68,** 842-843. **3780**

A drop of whole blood (to which an anticoagulant has been added) or of plasma is released at the height of 1 cm. into a solution of $CuSO_4$. If the drop remains stationary for 5–15 sec. before rising or sinking, its specific gravity is identical with that of the $CuSO_4$ soln. —M.G.G.

MONTAGU, J. D. (1957). **An elastic band for recording respirations.**—*Lancet* **272,** 126. **3781**

A band of special conductive rubber, 0·5in. wide, 0·06 in. thick and 20 in. long, was affixed between metal plates acting as terminals and fastened round the chest by means of adjustable tapes. The resistance of the rubber band was 100,000 ohms, which increased linearly on stretching by 10,000 ohms./mm. length. A direct current passed through the band therefore varied in accordance with respirations which were recorded pictorially by feeding the current to one arm of a Wheatstone bridge, the output of which was taken through an amplifier to an electro-encephalograph.—E.V.L.

See also abstr. **3558** (preservation by freezing of trypanosomes); **3561** ("M.I.F." fixative-stain for diagnosis of human trichomoniasis); **3752** (artificial insemination in hens).

MISCELLANEOUS

BURNET, F. M. (1957). **Biology and medicine.** —*Med. J. Aust.* March 30th 405-410. **3782**

B. discussed the effect of ionizing radiation and in particular genetic factors on human health. He expects a steady deterioration in the genetic constitution of the human species, unless a socially acceptable substitute is provided for natural selection.—M.G.G.

REPORTS

GREAT BRITAIN. (1957). **The Lister Institute of Preventive Medicine. Report of the Governing Body 1957.** pp. 28. London: The Institute. **3783**

The report covers research on microbiology, immunology and serology, experimental pathology, biochemistry and biophysics. A list of 53 papers published by the staff is given. In studying the inheritance of bacteria it was found that many coliform bacteria produce colicine substances which kill certain strains of coliform bacteria. When a non-colicinogenic strain is grown in a mixture with a colicinogenic strain, some of its cells may acquire a colicinogenetic property. The mechanism of this "infective heredity" is uncertain. Bacteriophages:—

research was continued on antiphage substances produced by actinomycetes, in the hope that they may prove useful in the study and control of animal viruses. The actinomycete A803 was studied in detail. This mould seems to produce at least three active substances: (1) an antiphage substance closely related to rutinlantins; (2) a substance of different chemical character and biological activity and (3) a substance with a wide range of antibacterial activity. The isolation of these substances for preliminary biological tests is under investigation.

In the Blood Products Laboratory the installation of equipment in the new laboratory was almost completed. Dried plasma and plasma fractions were prepared in gradually increasing amounts for the Health Service.

—D. S. RABAGLIATI.

NORTHERN RHODESIA. (1957). **Department of Veterinary Services Annual Report for the year 1956.** [SHEEHY, P. J.] pp. 19. Lusaka: Government Printer. 2s. 6d. **3784**

The year was favourable for cattle, with good grazing conditions in most areas. Local producers provided 30,561 cattle for the local market, and European farmers 12,928, the highest figure for years.

There were two important enactments during the year: The Cattle Culling (Palateau Tonga) Order, making it imperative to dispose of old and useless animals within a given time; and an African Livestock Improvement Scheme which provides subsidies for good bulls and a bonus for cattle over a certain grade.

In the Research Section, Dr. P. L. le Roux of the London School of Hygiene and Tropical Medicine completed a survey of helminths. Studies of the biology of the common ticks of Northern Rhodesia were continued.

FOOT AND MOUTH DISEASE was reported at the end of May on the Loanja River banks in the Sesheke district. Almost the whole of the cattle population of 27,980 were "virused" by the end of July.

TRYPANOSOMIASIS continues to give trouble in the Sesheke district. Attempts to "blanket out" the disease with dimidium bromide inoculations have not been completely successful, although the lives of hundreds of cattle have thereby been saved.

There was a great increase in RABIES. The apathy of the public towards the disease is appalling. In 1957 no dog will be licensed unless a valid certificate of inoculation is produced. The number of vaccinations was 23,680 as against 15,560 in 1955.

AGALACTIA in pigs occurred in the territory for the first time.

Details of material examined in the laboratory and the diagnoses made are tabulated: 2,387 specimens as against 2,985 in the previous year.—D. S. RABAGLIATI.

I. MACKINNON, J. (1957). **Southern Rhodesia veterinary report (field branch) summary, October, 1956.** — *Rhod. agric. J.* **54**, 93-97. **3785**

II. LAWRENCE, D. A. (1957). **Southern Rhodesia veterinary report (field branch) summary, November and December, 1956.**—*Ibid.* 98-101 & 102-105. **3786**

I. & II. Over 30,000 cattle, 953 sheep and goats and 39 donkeys were inoculated with ANTHRAX vaccine in Oct. and Nov. There were 135 deaths from BLACKLEG. Tuberculin testing disclosed 0·2% of reactors in 2,473 head of cattle and 2·14% in 2,578. Of 1,765 beef carcasses 0·34% were condemned on account of TB.; 36 pigs were also condemned. Agglutination tests of samples for BOVINE CONTAGIOUS ABORTION showed 9% positive. SENKOBO SKIN DISEASE occurs in the Sebungive District.

TRYPANOSOMIASIS—4,606 cattle were given prophylactic treatment with antrycide "pro-salt" in October in Chipinga Native District. Large numbers of blood smears were examined and herds found infected were treated with antriycide "pro-salt" or antrycide methyl sulphate. There were seven outbreaks of THEILERIOSIS in December; a few cases of HEARTWATER and PIROPLASMOSIS occurred in each month.

Of 230 bulls inspected, one was positive and five suspect for CONTAGIOUS EPIDIDYMITIS AND VAGINITIS. In the Native Districts 150 cases of this infection were confirmed. One farm was found infected with "LUMPY SKIN" DISEASE.

There were 7 outbreaks of FOWL TYPHOID, 2 of SPIROCHAETOSIS, 12 of PULLORUM DISEASE; and COCCIDIOSIS, FOWL POX and ROUP occurred sporadically.

Non-scheduled diseases included ANAPLASMOSIS, 58 cases; PIROPLASMOSIS, 2 cases in donkeys. Other diseases mentioned are PARATYPHOID, 24 deaths in December; MYIASIS; SWEATING SICKNESS; and POISONING by arsenic, organic insecticides and by plants.

—J. A. GRIFFITHS.

BASUTOLAND. (1957). **Annual Report of the Department of Agriculture, 1956.** pp. 68. Morija, Basutoland: Morija Printing Works. [Report of Principal Veterinary Officer: pp. 10-17.] **3787**

The year was a good one for all stock with

sustained rains in early summer and autumn and a consequent sufficiency of grass.

During the year 206 Angora rams were imported but there can be no appreciable improvement of the mohair clip until the undesirable rams are eliminated.

Except for "LUMPY SKIN" DISEASE in the Maseru area there were no outbreaks of any of the major diseases. Four outbreaks of ANTHRAX each involved one animal only, but 32,455 doses of anthrax vaccine were used.

"LUMPY SKIN" DISEASE appeared at the end of 1955 and in the early months of 1956 assumed epizootic proportions in the Maseru district. Treatment with penicillin and other antibiotics seemed to be beneficial and the outbreak died down after the first frost.

—D. S. RABAGLIATI.

COLONY OF FIJI. (1957). **Department of Agriculture Annual Report for the year 1956.** pp. 20. Suva; Govt. Press. Counc. Paper No. 8. 2s. [Items of veterinary interest pp. 7 & 8.] **3788**

The animal disease position remains satisfactory although bovine TUBERCULOSIS continues to give some concern. Vaccination with *Brucella abortus* Strain 19 against CONTAGIOUS ABORTION increased by 30%.

Tuberculin testing of cattle on farms selling milk is compulsory but the butter-producing farms are tested on a voluntary basis. Reactors were 4·8% against 4·5% the previous year. It is thought that herd testing rather than district testing is responsible for keeping up the percentage of reactors. Experimental testing has been carried out in some of the problem herds; this entailed the application of the intradermal neck test using P.P.D. tuberculin of human strain from Weybridge and the intradermal caudal fold inoculation of Australian C.S.L. tuberculin.

—D. S. RABAGLIATI.

SOMALILAND PROTECTORATE. (1956). **Department of Agriculture and Veterinary Services. Annual report.** [WATSON, J. M.] pp. 44. Items of veterinary interest pp. 16-20. **3789**

Although no case of ANTHRAX in camels has been reported, several demands for preventative vaccine were met. Although BOVINE CONTAGIOUS PLEUROPNEUMONIA is enzootic in the western district, it has not been troublesome.

The demand for antrypol, the only drug used against SURRA in camels, continues unabated. The original dose of 3 g. for an adult animal has been increased to 5 g. and instead of issuing the drug in 10% solution, it was issued in single-doses in powder form. This has not increased the cost and there has been no case reported of the drug failing to cure the disease.

Several outbreaks of RINDERPEST occurred, the most important being in the south-east and losses have been heavy, estimated at about 30%. The outbreak was controlled by the use of attenuated goat virus vaccine. By vaccinating the animals free of charge, the owners have been encouraged to co-operate with the veterinary service and some 20,000 cattle were vaccinated during the year. No case of RABIES was reported during the first ten months, although complete absence of the disease remains questionable if certain statements concerning the behaviour of some wild carnivores can be believed.

The most serious disease amongst sheep and goats was parasitic MANGE which caused great losses owing to its debilitating nature.

—D. S. RABAGLIATI.

U.S.A. (1956). **Report of the New York State Veterinary College at Cornell University for the year 1955-56.** pp. 105. Ithaca, New York: The College. **3790**

This report summarizes research work done by the College staff and gives figures for cases and material dealt with by the College clinics and laboratories. It also includes the 9th annual report of the Mastitis Research and Control Programme of the College (pp. 79–104), and statistical reports from 6 regional poultry disease laboratories.—R.M.

BOOK REVIEWS

KRÜGER, W. (1957). Tilgung der Rindertuberkulose, Ergebnisse und Erfahrungen für die Sanierung von Rinderbeständen. [**Eradication of bovine tuberculosis: results and experiences.**] pp. ix+184. Jena: Gustav Fischer Verlag. DM 11. **3791**

Details are given of an attested TB.-free herds scheme in East Germany, which is being introduced in accordance with a resolution of 1955, to eradicate bovine TB. within 10 years. Control measures in other European countries and their relative merits are discussed. The 10-year plan is supervised and enforced by the Ministry of Agriculture, through six local branches which are responsible for examination of milk, sputum, urine and faeces samples, typing of tubercle bacilli, etc.

Tuberculin testing is to be carried out by districts, of which there are 400, comprising about 1,400 herds each. The total cattle popula-

tion is estimated at about 4 million, half of which are dairy cows.

The publication contains numerous statistical data, graphs and illustrations. There is an appendix on relevant legislation and a list of 107 references.—E.G.

CRAMPTON, E. W. (1956). **Applied animal nutrition. The use of feedstuffs in the formulation of livestock rations.** pp. xx+458. San Francisco: W. H. Freeman & Company. London: Bailey Bros & Swinfen, Ltd. 55s. **3792**

In this book, designed expressly to help bridge the gap between animal nutrition and livestock feeding practice, the author has produced a text quite different in its approach from that of most other books on animal nutrition. Much of the fundamental information on proteins, carbohydrates etc. and their biochemical functions has been omitted. Instead, the author has set out in a methodical way the knowledge which is likely to be required by anyone faced with the problem of devising the most effective and economical rations from available materials.

The book is divided into five sections: (1) "What are feedstuffs," dealing with terminology in the feeding stuff industry and with methods used to assess the nutritive value of various materials; (2) "Nutritional requirements of animals," dealing with the needs of various classes of stock for energy, protein, minerals, vitamins etc., and the use of feeding standards; (3) "The nutritional characteristics of some common feeds," in which the value of various kinds of feedingstuffs in satisfying these needs is considered; (4) "Ration formulation," dealing with the preparation of formulae for meal mixtures, and mineral supplements for cattle and pigs; (5) appendices of feeding guides, legislation, and tables of feed composition.

There seems little doubt that this work will form a very valuable addition to the list of books on animal nutrition.—W. H. PARR.

MOORE, T. (1957). **Vitamin A** pp. xx+645. Amsterdam (London, New York & Princeton): Elsevier Publishing Company. 76s. [Distributors: London: Cleaver-Hume Press Ltd. New York: D. van Nostrand Co. Inc.] **3793**

More work has probably been published on vitamin A than on any other vitamin. The various forms in which it occurs, the various provitamins that exist in nature, and the different clinical symptoms which are attributed to its deficiency have made it a popular subject for study. Yet we still know little about its fundamental role in the animal body.

This book gathers together in eight parts most of what is known about the vitamin. The history, chemistry, and methods of estimation of the vitamin itself and of chemically or biologically related materials are described in the first four parts. The fifth part deals with the physiology and biochemistry of these compounds. The pathology of vitamin deficiency or excess is described in part 6, and with special reference to man in part 7. The last part contains, among others, a chapter on vitamin A in farm and domestic animals. It is perhaps a pity, from a veterinary point of view, that more space was not devoted to this chapter. For example, the author's critical assessment of liver and blood levels of vitamin A below which symptoms might appear in various species would have been very welcome.

The book is written in a pleasant, almost intimate, style and with a sparing use of technical terms, which make it very easy to read.

—W. H. PARR.

MÜSSEMEIER, F. (1957). Grundsätzliches zur Tierseuchenbekämpfung—Allgemeine Veterinärpolizei. **[Principles of animal disease control.]** pp. 267. Berlin (& Hamburg): Paul Parey. DM 21. **3794**

The author, who celebrated his 80th birthday in March 1956, has embodied in this book the results of 50 years' experience of the control of animal diseases in Germany. It is a critical discussion of German law, but there is much in the nature of general principles which is of world-wide application. The main sections of the book are:— Requirements and basis of disease control in general; Legislative and organizational basis of disease control; Specific measures; Compensation; Penalties.—R.M.

ANON. (1957). **British national formulary, 1957.** pp. 226. London: The British Medical Association, The Pharmaceutical Society of Great Britain. 6s. 6d. **3795**

This pocket book of drugs and prescriptions recommended by the British Medical Association and the Pharmaceutical Society first appeared in 1949. The word "British" has been added to the title of this revised edition in order to distinguish it from an American publication having the same name but a very different scope. In addition to the formulary proper, there is a list of proprietary names with approved names,

a pharmacological classification, and much other information. The features which distinguish this book from other pharmacopoeias are its small size and low price, and a comprehensive and up-to-date content. Veterinary dosages are not included, but it will provide a useful guide for veterinary practitioners and students.—R.M.

MEISTER, A. [Professor of Biochemistry, Tufts University School of Medicine, Boston, Massachusetts.] (1957). **Biochemistry of the amino acids.** pp. xiii + 485. New York (& London): Academic Press Inc. $10.00. **3796**

This, the latest volume on amino-acid biochemistry deals with the chemistry, metabolism and physiological roles of the natural amino-acids. The discussion of the physical and chemical properties is kept to a minimum while the major part of the book describes the chemical reactions which amino-acids undergo *in vivo*. Intermediary metabolism is, in fact, covered so extensively that over 1000 references are made to the literature in this chapter alone. Useful diagrammatic summaries of the metabolic pathways of the most common amino-acids are also given at the end of each section of the chapter.

By omitting the controversial topic of protein synthesis, the author brings into sharper focus the other routes by which amino-acids are known to be utilized and interconverted. While these metabolic reaction sequences are probably best worked out for some micro-organisms and in the case of the rat and although some species differences do occur, "many pathways are virtually the same in widely different species." Abnormalities in amino-acid metabolism which are fundamental to certain human pathological conditions (Garrod's inborn errors of metabolism for example) are discussed in the short final chapter.

The book is well written and can be recommended to those who require a coherent up-to-date account of amino-acid metabolism.

—D. S. PATTERSON.

THORNTON, H. [Chief Veterinary Officer, City and County of Newcastle upon Tyne.] (1957). **Textbook of meat inspection. Including the inspection of rabbits and poultry.** pp. viii + 592. London: Baillière, Tindall & Cox. 3rd Edit. 60s. **3797**

Since its first appearance in 1949, Thornton's Textbook of Meat Inspection has established itself as a standard work on the subject and it can be said that this third edition will enhance its reputation, for not only has there been a general revision of the text, but new material has been added. This includes a fuller account of the bacteriology of food poisoning and the procedures to be adopted in the bacteriological examination of meat, the importance of which is stressed. In addition bovine tuberculosis and the differential diagnosis of bovine and avian types of tuberculosis in pigs is more fully considered. The section dealing with the inspection of fish which appeared in the earlier editions has been omitted. The method of treatment of the subject has not been altered, but a useful addition is the inclusion of the judgments recommended by the United States Bureau of Animal Industry in the Assessment of the fitness of food products for human consumption.

This book is one which should be carefully studied by all those who are in any way concerned with meat inspection duties, but, in addition, it may be highly recommended to the general reader for the clear account it gives of the diseases of food animals.

The book is extremely well produced and contains excellent illustrations, some in colour.

—J. A. NICHOLSON.

FISHER, R. A. [Professor of Genetics, University of Cambridge.] & YATES, F. [Head of Statistical Department, Rothamsted Experimental Station.] (1957). **Statistical tables for biological, agricultural and medical research.** pp. x + 138. Edinburgh (& London): Oliver & Boyd. 5th Edit. revised and enlarged. 24s. **3798**

The fifth edition of this indispensable work includes new and more detailed tables of transformations for use in the analysis of frequent data. The new tables give the logit and complementary loglog transformations. The tables of the angular transformation, of χ^2 and of natural logarithms have been enlarged. Other tables added will be of interest mainly to geneticists and mathematicians. As in previous editions, a concise, if somewhat cryptic, explanation of the use of the tables is given in an introduction that now occupies 37 pages. The high standard of printing and good quality paper of the previous editions has been maintained and the book remains very good value for money.

—F. B. LEECH.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

DERIVAUX, J. (1957). Obstétrique vétérinaire. [**Veterinary obstetrics.**] pp. 392. Paris: Vigot Frères. Fr. 3500.

DOBBERSTEIN, J. (1957). Richtlinien für die Sektion der Haustiere. [**Technique of post-mortem examination of the domestic animals.**] pp. 125. Berlin (& Hamburg): Paul Parey. 8th Edit. DM 13.80.

HAGAN, W. A. & BRUNER, D. W. (1957). **The infectious diseases of domestic animals. With special reference to etiology, diagnosis, and biologic therapy.** pp. xx+968. London: Baillière, Tindall & Cox. 3rd Edit. 84s.

HARRISON, R. G. (1957). **Studies on fertility. Including papers read at the Conference of the Society for the Study of Fertility, London, 1956. Being Volume VIII of the Proceedings of the Society.** pp. x+138. Oxford: Blackwell Scientific Publications. 25s.

SCOTT-WILSON, H. W. (1957). **Aids to bacteriology.** pp. viii+403. London: Baillière, Tindall & Cox. 9th Edit. 12s. 6d.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey Surrey.

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1. CHEMOTHERAPY OF PIROPLASMOSIS AND THEILERIOSIS OF FARM ANIMALS IN THE U.S.S.R.
   R. Mack, *Commonwealth Bureau of Animal Health, Weybridge.*
2. SPONTANEOUS DIABETES IN DOMESTIC ANIMALS.
   J. S. Wilkinson, *Department of Pathology, Royal Veterinary College, London.*
3. THE AVIAN LEUCOSIS COMPLEX—A REVIEW.
   L. G. Chubb and R. F. Gordon, *Houghton Poultry Research Station, Huntingdonshire.*

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ERRATA

p. 14, abst. 90. The last sentence should read: "Infection did not occur in the chicks with ligated pancreatic ducts."

p. 32, abst. 201. Title line 1. The date should be 1956 and not 1955 as printed.

p. 56, abst. 338, line 2 of abst. For "oxytoxin" read: oxytocin.

p. 128, abst. 801, line 2. For "inpection" read: inspection.

p. 131, Line 3 from end of page does not belong to abst. 824, but is the last line of abst. 823. It should be transposed.

p. 134, abst. 837. In penultimate line, read: milk production . . .

p. 139, abst. 870. Last sentence should begin: "Synergic activity was noted . . ."

p. 156, abst. 965. col. 2, line 11. For "larve," read: larvae.

p. 158, abst. 971. col. 1, line 13, from below should read: "separately described and the relevant distinctions . . ."

p. 186, abst. 1136. Title translation, line 3. For "ascaricide" read: acaricide.

p. 215, Lines 1—3 in column 1 belong to abst. 1313 and should follow line 4 of that abst. Lines 1—3 in column 2 belong to abst. 1314 and should follow the first line of that abst.

p. 267, column 2, line 18. For "abomsum" read: abomasum.

p. 304, abst. 1808, line 2 of abst. For "phosponic" read: phosphonic.

p. 368, abst. 2161 line 5. For "60 g. per 100 ml." read: 60 μg. per 100 ml.

p. 378, abst. 2221 (II). In line 14 read: The data considered with . . .

p. 382, abst. 2238 line 2 of abst. For "osomoreceptors" read: osmoreceptors.

p. 393, abst. 2297, line 5 from below. For "*M. platypoeclius*" read: *M. platypoecilus*

p. 406, abst. 2379. In first line of Polish title (last line of page) for "altary" read: Altary.

p. 413, abst. 2420. Title translation, line 2. For "immunologocal" read: immunological.

p. 469, abst. 2717. Line 5 of title. For "Ser. 67, E." read: Ser. E. 67,.

p. 471, abst. 2729. In line 1 of abst., for "worms" read: mites.

p. 487, abst. 2812, line 1. For "bacterial action" read: bactericidal action. The reference in last line of abst. should read: *V.B.* **27**, 2993].

p. 495, abst. 2860, line 1 of abst. The endometrium of only 109 of the 200 cows mentioned was examined. For "200 cows" read: 109 cows.

p. 501, abst. 2878. In title, line 1, read: penicillin.

p. 533, abst. 3064. The second author's name should read: Bernhard, W.

p. 569, abst. 3239. In title translation, line 1, for "*Babesia bovis*" read: *Babesia ovis*.

p. 583, Foot of page. The cross-reference to abst. 3239 should read: (cycle of *B. ovis* in *Rh. bursa*).

p. 603, abst. 3450. The first sentence should be amended to read: Desoxycorticosterone acetate given s/c to hens in their first year of lay interrupted egg production; moulting began 12 days later.

p. 625, abst. 3572. In para. 2, line 3, read: *Moniezia* sp.

p. 629, abst. 3594. In line 2 of Slovak title, read: chrípkových.

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